Distr.
LIMITED

UNIDO/IO.548
21 June 1983

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ENGLISH

MANUAL FOR PLANNING

THE DEVELOPMENT OF CAPITAL GOODS INDUSTRIES *

Prepared for the Industrial Planning Section

by

M.M. Luther, Chief Technical Adviser,
Capital Goods Development Project in Turkey
(DP/TUR/76/034)

---

* This document has been reproduced without formal editing.

V.83-57501

TABLE OF CONTENTS

		Page
Chapter I	Introduction	1
Chapter II	Objectives of Capital Goods Development Project	4
Chapter III	Conceptual Frameworks Priorities and Strategy	10
Chapter IV	Classification and Codification of Capital Goods	19
Chapter V	Methodology for Process Industries	23
Chapter VI	Methodology for General Purpose Machines	34
Chapter VII	Mothodology for Transport Sector	47

LIST OF ANNEXES

Annex I	List of Major Divisions, Divisions and Major Groups According to ISIC	53
Annex II	Reference List of Major Groups of Industries for Selection of Priority Sectors	57
Annex III	Capacity Survey for Units Manufacturing or Proposing to Manufacture Capital Goods	60
Annex IV	Modular Production Chart	66
Annex V	Industry Activities Chart	67
Annex VI	ISIC Codes for Commodities	68
Annex VII	Modular Process Flow Diagram	71
Annex VIII	Plant Survey Form	72
Annex IX	Time-table for Pre-feasibility Activities Process Industries	73

CHAPTER I

INTRODUCTION

1.1. This manual sets out the methodology that was developed, tested and followed in the Capital Goods Development Project in Turkey and takes into account the experience similar to UNIDO projects in other countries.

1.2. Plans for manufacture of Capital Goods are generally related to growth of industries that they serve but the method of establishing this linkage varies from country to country. At the outset of the Capital Goods Project in Turkey it was realised that it would be necessary to develop a methodology which will enable the demand of capital goods to be linked to basic parameters which effect the specifications and quantity of capital goods.

These parameters are:

(i) Product
(ii) Stages of manufacture of the product
(iii) Technology
(iv) Plant sizes

1.3. Simultaneously it was realised that it would be necessary to work out the demand of capital goods in such a manner as will enable conceptualisation of their bound specifications and some chosen manufacturing characteristics.

1.4. In order to make use of international codes in the case of process industries the 4 digit International Standard Industrial Classification of all Economic Activities (ISIC) was used as the basis for identifying the industry parameters and 9 digit codes were developed for each process industry. In the case of capital goods, the 5 digit Standard Industrial Trade Classification (SITC) Rev. II was used as the basis and 15 digit codes were developed to provide for

(i) nomenclature
(ii) major specifications

(iii) manufacturing characteristics and
(iv) source of supply (indigenous or imported)

1.5. In the case of process industries it was imperative that basic concepts of the methodology are uniformly followed and this required considerable coordination between a large number of experts with different backgrounds and more importantly, coming from industries with widely different products, technologies and capital goods. In some cases modification had to be made to suit the peculiar requirements of the industry without sacrificing the basic principles which would govern the desired output. For example important variations had to be made in the case of Power (generation, distribution and transmission), Petrochemicals and Pulp and Paper.

1.6. In an exercise like this there is always the danger of getting involved in unnecessary details. Keeping in view that the purpose is to get a broad idea of the demand at the macro level, a careful watch was kept by me to ensure that the detail to which Classification and Codification of industries and capital goods was done and individual activities analysed were JUST ENOUGH to meet this objective of macro-level planning. It had to provide adequate information to conceptualise the future course of development of industry, not too little to make it vague and indefinite and not too much to confuse the policy issues. For example when working out the requirement of metal cutting lathes, one approach is to work out the details as per the relevant 5 digit SITC code which is

"736.13 Lathes, metal working"

This obviously covering all sizes and types of lathes is much too general to formulate any logical plans. The other extreme would be to go into the details of 8-10 specifications of lathes which besides making the computer work unnecessarily complicated would serve no useful purpose since these details need to be considered at the time of feasibility studies and detailed project reports anyway. The correct course is to consider at the macro-level planning stage the demand of lathes by types and one major specifications (Capacity). This approach will keep the data processing within economical limits and provide technologically adequate guidelines for commissioning feasibility studies and detailed project reports to make them more realistic.

1.7. Another factor that has been considered as crucial in working out this methodology is its flexibility to enable modifications in programmes and priorities being quickly incorporated and revised computer outputs produced with the minimum of effort and cost. Increasing or decreasing the size of the plant, change of technology, shifting of project schedules, changes in major specifications can be quickly introduced in the computer files and revised demand projections made for a project, industry and the country.

1.8. The demand of capital goods has to be translated into parameters which represent manufacturing capacity. The 15 digit totals will provide this data in the case of machines but in the case of equipment which is principally steel fabrication, permutations and combinations of parameters of weight, material and plate thickness are essential to form an idea of the kind of manufacturing capacity that is required.

1.9. It is important to bear in mind at the time of survey of existing and anticipated capacity that the data collected corresponds to the parameters used for demand data. This will enable it to be transferred to the same computer files and demand-capacity balance struck to show the gaps in a manner which facilitate a techno-economic appraisal of future needs. This will be the key to any programme for development of capital goods.

M.M. LUTHER,

C.ENG.F.I.MECH.E.(LOND)F.I. PROD.E.(LOND),

CHIEF TECHNICAL ADVISER,

CAPITAL GOODS DEVELOPMENT PROJECT IN
TURKEY.

CHAPTER II

OBJECTIVES OF A CAPITAL GOODS DEVELOPMENT PROJECT

2.1. DEVELOPMENT PLANNING AND CAPITAL GOODS

2.1.1. Development plans of developing countries generally lay considerable emphasis on accelerated industrialisation, sometimes with heavy investment in the capital goods sector. They recognise the fact that development of indigenous capacity and capability for design and manufacture of capital goods is an essential prerequisite to unhindered industrial and technological growth. In preparing programmes, planners necessarily have to take into account the expertise developed in the field of intermediate and consumer goods and the stage of technological expertise, required for promoting a viable and strong base for manufacture of capital goods to feed them. The basic approach of a programme of development of capital goods has to take note of forward and backward linkages of capital goods with basic industries on the one hand and the total engineering goods sector on the other.

2.1.2. In the context of the objective of industrialisation, development plans of developing countries generally emphasise that public investment priority must be on capital goods industries. While allocations in this field have to be tailored to suit available foreign exchange and other resources, allocations of a comparatively small amount to capital goods industries is considered in the context of their effect on long-term development targets. With this background, planning and programming of capital goods assumes special significance in developing countries.

In all developing countries, the existing industrial structure, particularly heavy industry, has to be handled in a determined manner with all its technical and financial economic details, integration has to be achieved through supplementary investment projects if necessary and measures have to be adopted to rehabilitate existing structures. Selected capital goods industries with adequate production and marketing possibilities have to be given due consideration and their investment plans prepared in the light of demand projections and anticipated availability of resources.

2.1.3. Most capital goods industries require long periods of gestation, heavy initial capital outlays (a substantial portion of which may be in terms of foreign exchange for imported machinery), low profits, transfer of technology from developed or other developing countries and high degree of skills in managers, engineers and artisans. On account of those factors it is essential to take a policy decision on which areas should be covered by the public sector so that overall industrial progress does not suffer on account of shyness of priority sector to take up difficult, complex, low profit items.

2.2. IMMEDIATE OBJECTIVES

The immediate objectives of a well-coordinated project for planning and development of capital goods industry should cover the following:

(i) To design a scientific, flexible methodology suitable to the country for projecting sectoral demands of capital goods based on international codes for special purpose machinery, for priority process industries, service industries (e.g. Railways), for general purpose machines and infrastructure facilities such as castings and forgings.

(ii) Classification and codification of all capital goods relevant to selected sectors to suit technological parameters anticipated to be used in industry in future.

(iii) Adaptation and application of classification and codification system for process industries to each selected industrial sector.

(iv) To conduct an in depth study of selected new investment proposals for capital goods in the state sector.

(v) To compute demands of capital goods as codified, for selected priority sectors.

(vi) To aggregate above sectoral demands with the help of a computer programme from the point of view of manufacturing facilities.

(vii) To analyse the present and proposed capacity for selected capital goods in public and private sector establishments in the context of anticipated national demand and make recommendations for priority determinations.

(viii) To make recommendations for optimum utilisation of installed capacity for capital goods in public and private sectors.

(ix) To establish investment programmes in public and private sectors.

(x) To study policy considerations for development of capital goods industry and define instruments of policy needed to stimulate and promote it.

(xi) To carry out feasibility studies based on the above and make recommendations to attract the needed investment and technology.

(xii) To establish a data bank for capital goods industry and to lay the basis for its periodic updating to facilitate decision-making on the capital goods industry.

2.3. The activities which may be considered relevant for achievement of the immediate objectives are briefly given below:

2.3.1. Drawing up an agreed list of priority industries and capital goods to be covered by the project.

2.3.2. Adaptation of the basic methodology to suit local conditions including

(a) codifications of each industry according to applicable parameters of technology and plant sizes.

(b) codifications of capital goods not covered by Vol. II of this manual. (The feasibility of use of these codes for a national unified coding system may be explored simultaneously).

2.3.3. PROCESS INDUSTRIES

(i) Commodity demand projections for each process industry.

(ii) Capacity utilisations of manufacturing units.

(iii) Projections of capacity utilisation and anticipated national production of commodities.

(iv) An agreed list of likely investments to fill the demand-capacity gap separately for
 (a) modernisation and rehabilitation of existing plants
 (b) new plants

(v) Projections of demand of capital goods, cost wise and weight wise year by year, according to 15 digit codes for each planned investment and then for each industry.

(vi) Similar projections in terms of 5 digit SITC code (which forms the basis of the 15 digit code).

(vii) After computerised projections are available for individual sectors, it will be necessary to aggregate the demands of all process industries ON THE BASIS OF MANUFACTURING CHARACTERISTICS and conduct a technical analysis for determination of items and types which offer economy of manufacture VS imports. This is a fairly complex industrial engineering exercise and will need computer facilities and engineers.

2.3.4. Demand projections of general purpose machinery (e.g. machine tools).

2.3.5. Capacity survey of public and private sector capital goods manufacturing industry including projections of future production.

2.3.6. DEMAND CAPACITY BALANCE

A dependable demand-capacity balance for capital goods as codified can be struck only after the demands, as codified are aggregated, analysed and similar data on capacity in both and public sectors is available.

2.3.7. Drawing up an initial plan for investment possibilities covering proposals for
(a) expansion of existing units
(b) modification of projects in the pipe line and
(c) new projects.

2.3.8. Complexity analysis of capital goods to be manufactured to international standards in the context of present stage of technological development leading to
(a) assessment of manpower requirement (managerial and artisan)
(b) training profiles for engineers and workers.
This has been recommended in the first Consultation on Capital Goods in BRUSSELS in Sept. '81.

2.3.9. Comprehensive plans for exports of capital goods by themselves or as part of projects taken up by local contractors.

2.3.10. Coordination of feasibility studies to ensure that concepts worked out by the project are followed.

2.3.11. Investment promotion including assistance in technical collaboration and foreign equity proposals so that they remain in line with project outputs.

2.4. The following may be considered as possible areas of use of project outputs including providing linkage with development plans.

2.4.1. Planning/Sanctioning, additional capacity with or without incentives.

2.4.2. Detailed plans for optimal utilisation of capacity in each state enterprise engaged in machine building, including production management, financial management and production services.

2.4.3. Working out definitive and/or indicative targets for each sub-sector including detailing of rationale/coefficients used, (these could be used for future plans also).
1.1. Financial expenditure targets,
1.2. Physical completion/realisation targets,

1.3. Capacity utilisation targets,
(Particular attention to be paid to modernisation and rationalisation for optimum capacity utilisation).

2.4.4. A national data system for use in Government, public and private sectors including
   (i) evolution of industry codes to be used for all statistical purposes
   (ii) institutional and organisational framework.

2.4.5. Institutional, organisational and policy framework for formulation of annual plans for the manufacturing sector.

2.4.6. Systemisation of backward and forward linkages between different industry sectors and resources that they represent.

2.4.7. Policy formulation as applicable to capital goods sector for
   (i) Development of small sector and ancillary industries
   (ii) Exports of capital goods
   (iii) Exports of projects (Construction and engineering)
   (iv) Foreign collaborations
   (v) Incentives
   (vi) Protection of industry for capital goods sector
   (vii) Foreign investments

2.4.8. Evolution of a Technology Plan for capital goods concomitant with Development Plan.

2.4.9. Role of financial and specialised institutions for successful plan implementation in the manufacturing sector.

2.4.10. Advance Planning in respect of long gestation projects.

CHAPTER III

CONCEPTUAL FRAMEWORKS

PRIORITIES AND STRATEGY

3.1. BASIC CONSIDERATIONS

3.1.1. Programming of capital goods manufacture involves simultaneous consideration of a large number of independent parameters. In most developing countries, decisions on setting up new projects for machine building have been taken on the basis of ad-hoc consideration of requirements of one or two user sectors. While this method is partially valid for some such finished capital goods as are peculiar to a particular industry (for example capacity for finish-machining of steel rolling mills, being related to steel capacity), the problem gets a little complex when conceptualising quantitative and qualitative aspects of capacity for basic manufacturing operations (e.g. steel fabrication, casting, forging) which are common to a large number of capital goods. A problem that invariably faces the planner of capital goods is the depth to which an analysis of demand and capacity should be conducted. Considerably experience and foresight is required to ensure that any programme developed to take into account a large number of some mutually independent and some independent parameters does not go into such details as to defeat the objective of a macro-level approach and become counter-productive from the point of view of immediate objectives of the project and yet provides adequate data, with reasonable accuracy, to make it possible to give detailed technoeconomic consideration to alternative investment possibilities. A constant interaction between UNIDO experts and various teams working on a capital goods development project, to ensure that their work remains on course and is conducted in such a manner as to be pragmatic and realistic in its output will be the most critical factor in the success of the project.

3.2. USE OF INTERNATIONAL CODES

Two international codes have been used as the basis for programming of capital goods in this manual. The "International Standard Industries Classification (ISIC) of All Economic Activities" has been used for classifying and codifying parameters of industries and the "Standard International Trade Classification Rev. 2 (SITC)" for classifying and codifying the capital goods. Details of use of these codes and their elaboration to suit local constitutions are given in subsequent chapters.

3.3. PRIORITIES

Annexure I shows the ISIC code including major divisions, major groups and groups of industries as covered by the ISIC code. Considering constraints of time and resources a selective approach has to be adopted to identify high-priority sectors and sub-groups of ISIC chosen for detailed analysis. A suggested list OUT OF WHICH priority sectors may be chosen by each country, is at Annex II.

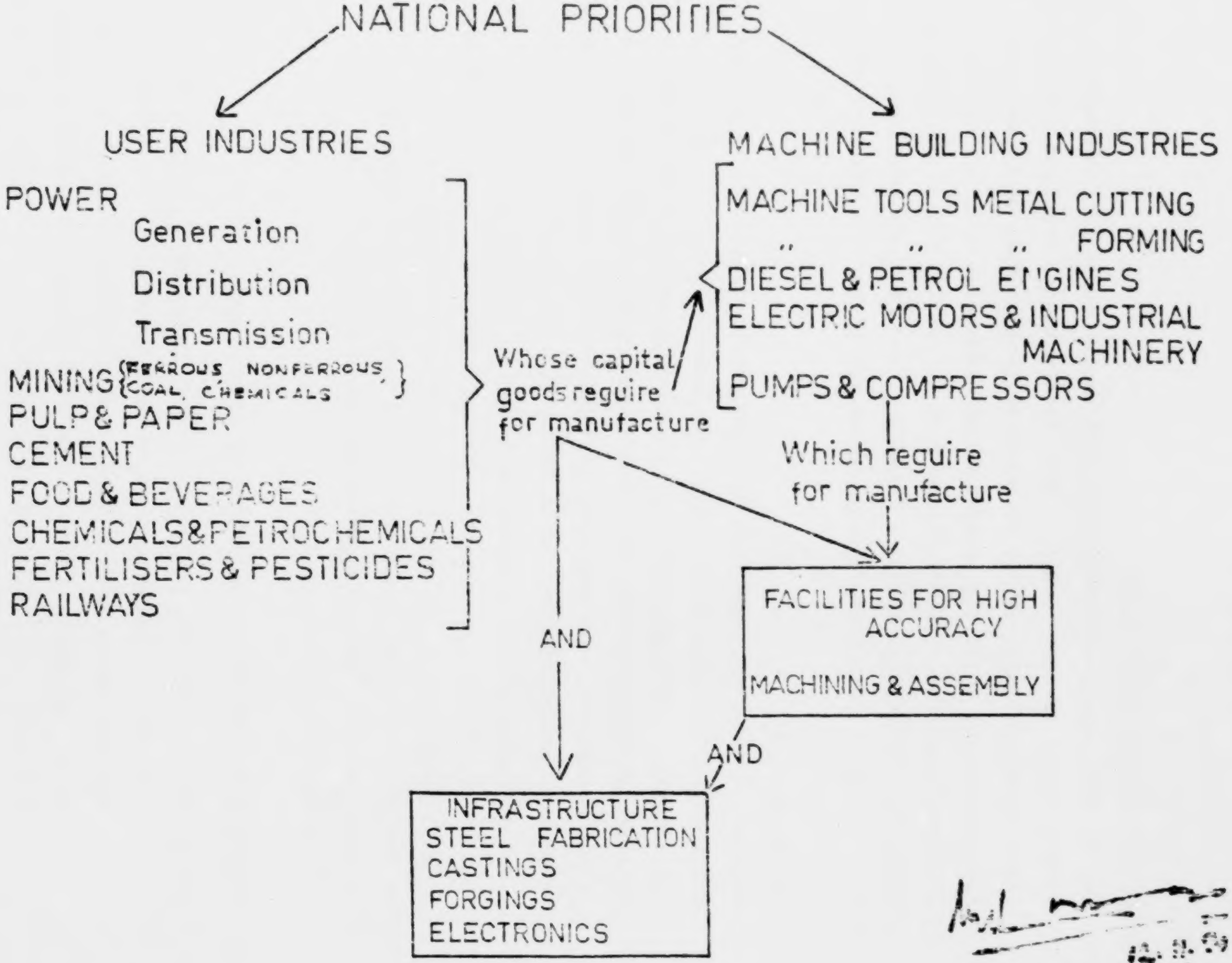
Simultaneously, with assessment of demand of capital goods for priority industries, urgent consideration should be given to the demand study of general purpose machines and the infrastructure required for the growth of the entire capital goods sector. A sample of national priorities of selected user industries, machine building industries and the infrastructure is shown on page 57.

3.4. STRATEGY AND CONCEPTUAL FRAMEWORK OF METHODOLOGY

3.4.1. This manual sets out well-defined, coordinated steps to achieve immediate objectives, assumed in Chapter II. The scientific approach using international coding systems, elaborated to suit local environments with a relatively simple mathematical model for macro level planning of investment opportunities is novel and has immense potentiality for use in all developing countries. Some important aspects of the approach to a capital goods study are spelt out below:

(i) Codification of all items has to cover all industries so that once developed, they can be used on a national basis.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY


NATIONAL PRIORITIES
USER INDUSTRIES
POWER
Generation
Distribution
Transmission
MINING {FERROUS NONFERROUS, COAL, CHEMICALS}
PULP & PAPER
CEMENT
FOOD & BEVERAGES
CHEMICALS & PETROCHEMICALS
FERTILISERS & PESTICIDES
RAILWAYS
Whose capital goods reguire for manufacture
MACHINE BUILDING INDUSTRIES
MACHINE TOOLS METAL CUTTING
" " " FORMING
DIESEL & PETROL ENGINES
ELECTRIC MOTORS & INDUSTRIAL MACHINERY
PUMPS & COMPRESSORS
Which reguire for manufacture
FACILITIES FOR HIGH ACCURACY
MACHINING & ASSEMBLY
AND
AND
INFRASTRUCTURE
STEEL FABRICATION
CASTINGS
FORGINGS
ELECTRONICS

14.11.69

(ii) A large number of capital goods are steel fabricated equipment. Besides projection of physical and financial values of each item of capital goods required, their physical characteristics such as type of steel, plate thickness and weight need to be assessed for aggregating demands from a manufacturing point of view leading to investment planning for steel-fabricated capital goods industry.

(iii) Data of machines to be collected and programmed MUST include broad parameters which can point towards MANUFACTURING FACILITIES required for them, and lead to definition of investment possibilities. Codification of capital goods has been developed with this objective in view and formats have to be designed to meet the requirements of different types of industries.

3.5. METHODOLOGY

3.5.1. As mentioned earlier, different concepts have to be used for working out the demand (in physical as well as financial items) for different types of industries. While for process industries, the basis will be technology and plant size for each stage of production of sub-products, by-products, etc., general purpose machinery will be based on macro-economic parameters while for transportation, quantification of different types of traffic to be moved over various sections will form the basis of requirements of aircraft, ships, trucks, buses and railway rolling stock of different specifications. Details of methodology followed for these groups of industries are given in Chapters V, VI and VII.

3.5.2. CLASSIFICATION AND CODIFICATION OF PROCESS INDUSTRIES

3.5.2.1. Based on 4 digit ISIC codes, 9 digit codes may be evolved for each industry for which capital goods are required to be assessed to cover product definition and parameters of stages of production, technologies and plant sizes. Any variation in one or more of these parameters will change the specifications and other characteristics of machinery and plant.

3.5.3. CLASSIFICATION AND CODIFICATION OF CAPITAL GOODS

3.5.3.1. Considering that a large number of capital goods for process industries are steel fabrications, a standard code has been evolved for classifying all fabricated equipment according to material used, their weight and plate thickness, the three most important parameters for planning manufacturing capacity of fabricated structures. This has been incorporated in the codes developed for each item of capital goods of this type. In the case of castings and forgings however, details of demand and capacity need to be worked out according to (i) material, (ii) weight and (iii) complexity in the case of castings and type (open or die) in the case of forgings. Suitable codes based on SITC and involving these parameters for castings and forgings have been evolved. General purpose machines, metal cutting and metal forming machine tools and electrical equipment which are not covered by process industries have also been classified and 15 digit codes based on the 5 digit SITC codes covering parameters of nomenclature, major specifications, manufacturing characteristics and supply source have been evolved by the capital goods project in Turkey. These are explained briefly in Chapters VI and VII and are shown for all capital goods covered by the project in Vol. II of this manual.

3.6. COEFFICIENTS FOR PROCESS INDUSTRIES

Once draft codging is completed, they need to be coordinated to evolve nationally applicable codes - a crucial activity prior to demand projections and their computerisation, aggregation. Coefficients are then built up to indicate the relationship between each code of the industry activity and codified capital goods required for them. These coefficients will quantify the physical and financial values of capital goods required for STANDARD plant capacities with such technologies as can be foreseen for future plants.

3.7. Subsequent steps to be covered are:

3.7.1. Projection of domestic demand for commodities:
This has to be coordinated with National Planning Agencies and projections made in 5 or 10 year block periods, clearly spelling out various assumptions made. Projections for 15-20 years are necessary with the background of experience in developing countries, that from the time of their conceptualisation heavy machine building units take 7-12 years before they reach optimum capacity utilisation.

3.7.2. Projection of demand for export of commodities
Considerable information on past trends is generally available. Future projections according to regions and countries need to be made, special attention being paid to each country's natural markets.
Alternatively, as a matter of policy, it may be decided to set apart a given percentage of installed capacity for exports.

3.7.3. A picture of available realisable capacity for production of commodities by user sectors will need to be collected as under:
(i) Actual production for the previous 10 years
(ii) Installed capacity for the previous 10 years
(iii) Installed capacity planned in the next 10-15 years.
(This will include units currently under erection as well as rehabilitation and modernisation of existing units).

Data collected will quantify the difference between installed capacity and actual production on account of non-availability of inputs like power, finances, etc. and lead to determination of gap to be filled in by new units or expansion of existing ones.

A basic assumption is that in the next 10-15 years these constraints will be removed and the installed capacity will be fully utilised.

3.7.4. CAPACITY UTILISATION OF CAPITAL GOODS INDUSTRY

3.7.4.1. Simultaneously with the demand analysis, the capacity of existing capital goods industry needs to be surveyed. This should take into account the equipment available, technological capabilities, quality control and present as well as future capacity for production of capital goods AS CODIFIED.

3.7.4.2. A format for collecting preliminary information suggested for this purpose, in two parts, is at Annex III.

3.7.5. CAPITAL GOODS REQUIREMENTS

3.7.5.1. Based on coefficients worked out, requirements of capital goods can be calculated for additional capacity required to be set up for each commodity.

3.7.5.2. Requirements of capital goods as codified also have to be worked out for renewals and replacements of machinery and plant where complete machines are replaced. In other cases the demand for renewals and replacements will be assessed as a percentage of the demand for new equipment.

3.7.6. Expert teams should also prepare write-ups on

(i) R and D in the user industries and its relationship with the machinery-producing units,
(ii) Standardisation of capital goods,
(iii) Quality control of indigenous industry,
(iv) Manpower planning,
(v) Transfer of technology,
(vi) Other policy measures including incentives.

3.8. CONSTRAINTS

From a study of data concerning the capital goods industry, in many countries, both in public and private sectors, it appears that not only its development but its capacity utilisation suffers on account of a number of factors, the principal amongst them being:

(i) Non-availability of imported inputs such as machinery and plant, raw materials, imported parts, components and sub-assemblies on account of scarcity of foreign exchange.

(ii) Scarcity of local currency,

(iii) Inadequate development of infrastructure in the form of quality castings and forgings,

(iv) Shortage of power,

(v) Shortage of qualified engineers and technicians for production management as well as other disciplines such as industrial engineering production planning and control, quality control and design. Impact of the constraints on future planning of capital goods industries needs to be examined in depth.

3.9. INVESTMENT POSSIBILITIES

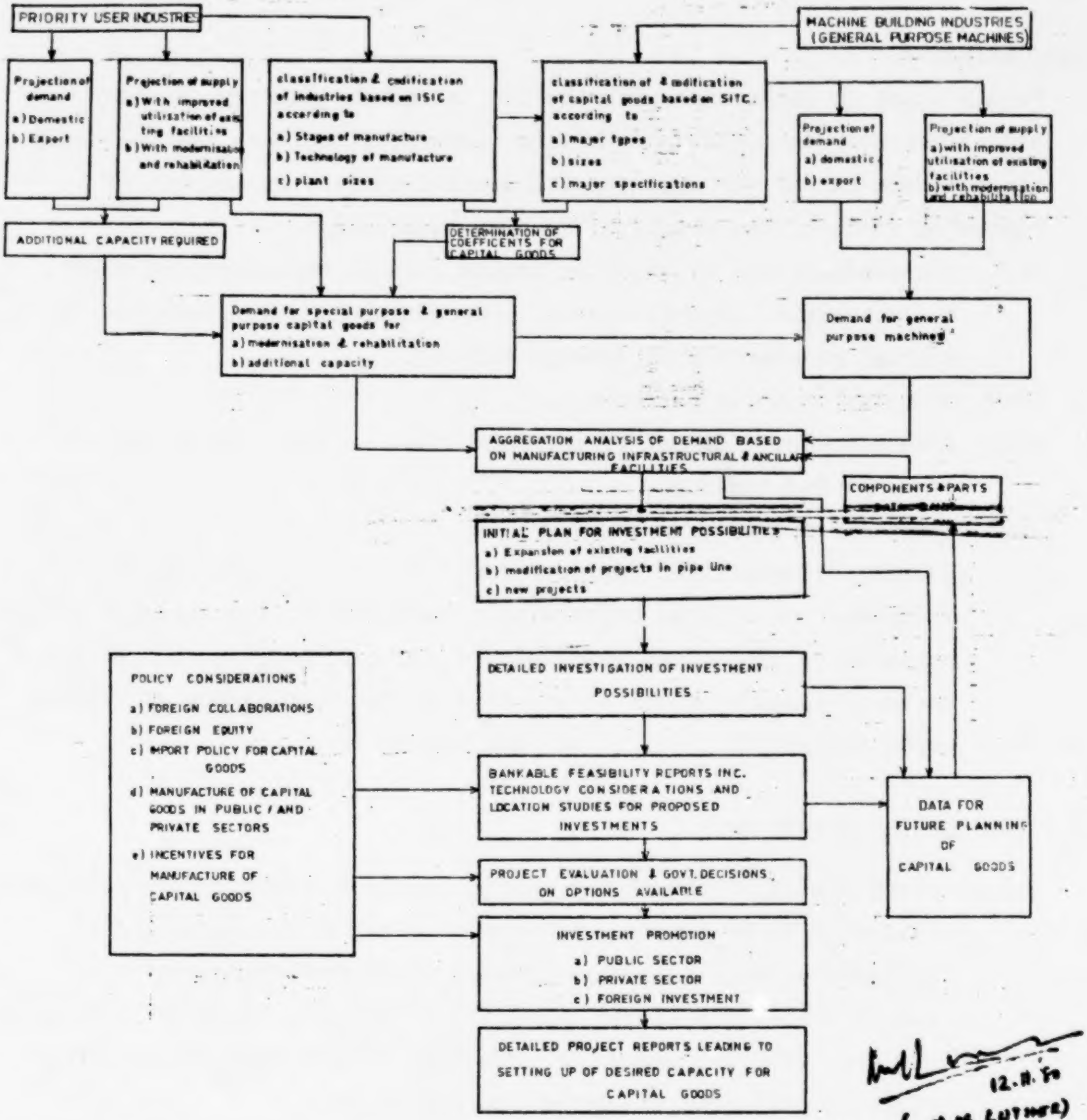
3.9.1. After totals of demand for capital goods as codified are available, they have to be examined by expert teams for the purpose of aggregating them to evolve product mixes for investment possibilities for either expansion of existing units or setting up new ones with due regard to proposals in the pipeline including those in different stages of implementation.

3.10. FEASIBILITY STUDIES

3.10.1. Feasibility studies and analysis for instruments of policy to promote the capital goods industry should be taken up as an integral part of any project for development of capital goods.

3.11. A chart showing outline of a strategy that may be followed for a capital goods project is at page 18.

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY
STRATEGY


PRIORITY USER INDUSTRIES
Projection of demand
a) Domestic
b) Export
Projection of supply
a) With improved utilisation of existing facilities
b) With modernisation and rehabilitation
classification & codification of industries based on ISIC according to
a) Stages of manufacture
b) Technology of manufacture
c) plant sizes
MACHINE BUILDING INDUSTRIES (GENERAL PURPOSE MACHINES)
classification of & codification of capital goods based on SITC. according to
a) major types
b) sizes
c) major specifications
Projection of demand
a) domestic
b) export
Projection of supply
a) with improved utilisation of existing facilities
b) with modernisation and rehabilitation
ADDITIONAL CAPACITY REQUIRED
DETERMINATION OF COEFFICENTS FOR CAPITAL GOODS
Demand for special purpose & general purpose capital goods for
a) modernisation & rehabilitation
b) additional capacity
Demand for general purpose machines
AGGREGATION ANALYSIS OF DEMAND BASED ON MANUFACTURING INFRASTRUCTURAL & ANCILLARY FACILITIES
COMPONENTS & PARTS
INITIAL PLAN FOR INVESTMENT POSSIBILITIES
a) Expansion of existing facilities
b) modification of projects in pipe line
c) new projects
POLICY CONSIDERATIONS
a) FOREIGN COLLABORATIONS
b) FOREIGN EQUITY
c) IMPORT POLICY FOR CAPITAL GOODS
d) MANUFACTURE OF CAPITAL GOODS IN PUBLIC / AND PRIVATE SECTORS
e) INCENTIVES FOR MANUFACTURE OF CAPITAL GOODS
DETAILED INVESTIGATION OF INVESTMENT POSSIBILITIES
BANKABLE FEASIBILITY REPORTS INC. TECHNOLOGY CONSIDERATIONS AND LOCATION STUDIES FOR PROPOSED INVESTMENTS
DATA FOR FUTURE PLANNING OF CAPITAL GOODS
PROJECT EVALUATION & GOVT. DECISIONS ON OPTIONS AVAILABLE
INVESTMENT PROMOTION
a) PUBLIC SECTOR
b) PRIVATE SECTOR
c) FOREIGN INVESTMENT
DETAILED PROJECT REPORTS LEADING TO SETTING UP OF DESIRED CAPACITY FOR CAPITAL GOODS

12.11.70
(H.M. LUTHER)

CHAPTER IV

CLASSIFICATION AND CODIFICATION OF CAPITAL GOODS

4.1. Classification of machinery

4.1.1. The purpose of classification of machines is to identify machines with similar functions and capacity, in one group and by the same code number, so that it is possible to get arithmetic summation of demand and manufacturing capacity for them.

4.1.2. A 15 digit system starting with the 5 digit SITC code has been developed. First 14 digits are allocated for machine definition, the last digit being used for information on whether it is imported or indigenously manufactured. Coding criteria in 15 digits machine coding system is given in the table below by code levels.

Codification criteria and related code cells

Code cells	Codification criteria
1 2 3 4 5 9 9 9 9 9	SITC Group name
6 7 9 9	Machine name
8 9	Major specification (Capacity)
9 9	Major specification (Optional)
10 9	Major specification (Optional)
11 9	Type
12 9	Manufacturing characteristic (Weight)
13 9	Manufacturing characteristic (Material)
14 9	Manufacturing characteristic
15 9	Origin

4.1.3. Coding criteria are explained below:

4.1.3.1. SITC GROUP NAME: It is the name of the machinery consisting of the lowest level of SITC and represented by the first 5 digits.

4.1.3.2. MACHINE NAME: States the general name which describes the machine and is used for all machines performing same function. At this level, they are classified from general to specific. For example SITC group 716.21 represents group name "Electric Motors and Generators" (including universal AC/DC motors) other than direct current and the next 2 digits will separately identify MOTORS AND GENERATORS under this group.

4.1.3.3. MAJOR SPECIFICATIONS

While one major specification capacity (8) is obligatory in all cases, others are optional depending on the degree to which the equipment needs to be codified.

4.1.3.4. TYPE

One digit indicates different types of machines having the same name.

4.1.3.5. MANUFACTURING CHARACTERISTICS

The details include weight (12), type of material (13), main body material for machines and type of steel for fabricated equipment, while digit 14 in the case of fabricated equipment gives maximum thickness of plate and in the case of machines, maximum weight of a component.

4.1.3.6. ORIGIN

15th cell of machine code is to identify whether it is domestically produced or is imported.

4.1.4. A sample of classification and codification under SITC code 716.21 - Electric Motors (including universal AC/DC motors), other than Direct Current is on page 21.

SITC Code 716.21 - ELECTRIC MOTORS(INCLUDING UNIVERSAL AC/DC MOTORS), OTHERS THAN DIRECT CURRENT   Machines

6-7	8	9	10	11	12	13	14	15
Basic Machine Nomenclature	Major Spec. (Capacity)	Major Spec.1 Optional	Major Spec.2 Optional	Type	Manufacturing characteristic 1	Manufacturing characteristic 2	Manufacturing characteristic 3	Origin
Name	Power(KW)	Synchronous speed(RPM)	Voltage (V)	Descrip.	Weight (Tons)	Main body material	Max. component weight(tons)	
50 Single phase commutator motors	1 Upto 10	1 Upto 375	1 Upto 500	1 Open	1 Upto 5	1 Chilled iron casting	1 Upto 1	1 Turkey
51 Universal motors	2 10-50	2 600	2 500-3000	2 Closed	2 5-10	2 Grey iron casting	2 1-2	2 Imported
52 Series motors	3 50-100	3 750	3 3000-6000	3 Gas proof	3 10-25	3 Alloy iron casting	3 2-5	
53 Neutralized series motors	4 100-200	4 1000	4 Over 6000	4 Flame proof	4 25-50	4 Malleable iron casting	4 5-10	
54 Repulison motors	5 200-300	5 1500		5 High ambient temp. proof	5 50-100	5 Spheroidal iron casting	5 10-15	
55 Repulsion-induction motors	6 300-500	6 3000		6 Water-proof	6 100-200	6 Carbon steel casting	6 15-25	
60 Reluctance motors	7 500-1000	7 Over 3000		9 Others	7 200-300	7 Alloy steel casting	7 25-50	
61 Polyphase reluctance motors	8 1000-3000				8 300-500	8 Non-ferrous casting	8 50-100	
62 Hysteresis motors	9 Over 3000				9 Over 500	9 Steel fabrication	9 Over 100	
63 Hysteresis/reluctance motors								
70 Special motors								
71 Permanent magnet motors								
72 Servo control motors (Synchronous, stepper motors)								
73 Power control motors(Selsyne)								
74 Doubly-fed induction motors								
75 Linear motors								

For example Code 716212145241211 represents the following:
SITC Group 716.21 - Electric Motors (including Universal AC/DC Motors), other than Direct Current
Machine Name - 21 - Slip-ring induction motors
Major Specification (Capacity)-4-(100-200 KW)
Major Specification (Speed RPM)-5-(1500)
Major Specification (Voltage-2-(500-3000)
Type-4-(Flame proof)
Manufacturing characteristic (Weight)-1-(Up to 5 Tons)
Manufacturing characteristic (Main body material-2- Grey iron casting
Manufacturing characteristic (Max. component weight)-1-Up to 1 Ton
Origin-1- indigenously.

4.1.5. 15 digit codes developed for all capital goods and covered by the SITC code Division 69 for "Manufacture of metal, NES" classifying structures and containers and group 7, classifying all "Machinery and Transport Equipment" as developed and used by the Capital Goods Project in Turkey are contained in Vol. II of this Manual.

4.1.6. In some cases the 5 digit code - SITC Rev. 2 was not adequate to cover the different types of machinery and plant which needed to be separated. In these cases additional 5 digit codes were introduced.

4.1.7. 8 digit codes for castings and forgings based SITC code 679.3, 679.41, 679.42 are also contained in Vol. II of the manual.

CHAPTER V

METHODOLOGY FOR PROCESS INDUSTRIES

5.1. This chapter spells out the basic logic of various activities in so far as they concern the following major groups identified in ISIC code:-

111	Agricultural and livestock production
121	Forestry
122	Logging
210	Coal Mining
220	Crude Petroleum and Natural Gas Production
230	Metal Ore Mining
290	Other Mining
311 312	Food manufacturing
313	Beverage industries
314	Tobacco manufactures
321	Manufacture of textiles
322	Manufacture of wearing apparel, except footwear
323	Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel
324	Manufacture of footwear, except vulcanized or moulded rubber or plastic footwear
331	Manufacture of wood and wood and cork products, except furniture
332	Manufacture of furniture and fixtures, except primarily of metal
341	Manufacture of paper and paper products
342	Printing, publishing and allied industries
351	Manufacture of industrial chemicals
352	Manufacture of other chemical products
353	Petroleum refineries
354	Manufacture of miscellaneous products of petroleum and coal
355	Manufacture of rubber products
356	Manufacture of plastic products not elsewhere classified
361	Manufacture of pottery, china and earthenware
362	Manufacture of glass and glass products

369	Manufacture of other non-metallic mineral products
371	Iron and steel basic industries
372	Non-ferrous metal basic industries
410	Electricity, Gas and Steam

Modifications to adapt it to peculiar needs of each of these subsectors have to be done and explained in sectoral studies which should provide projections for the industry and their capital goods.

5.2. Since capital goods projects deal with future requirements, only such capacities, technologies and other details as are relevant to FUTURE PLANTS have to be conceptualised and indicated.

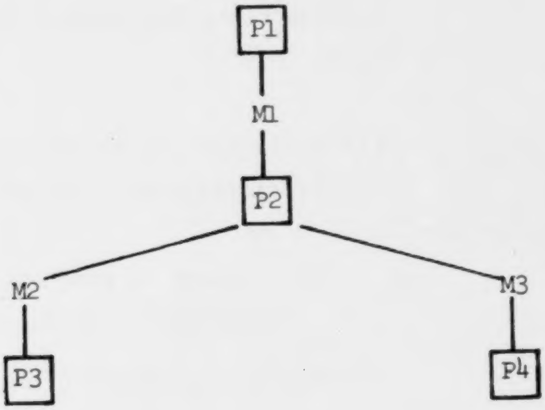
5.3. Explanatory notes are given below:

5.3.1. Classification and codification of user industry

5.3.1.1. PREPARATION OF A "MODULAR PRODUCTION CHART"

5.3.1.1.1. This chart showing relationship of products, intermediate products, by-products and waste products, identifies stages of manufacture and does not take into account technologies and capacities of the plant and machinery. An example is shown as Annex IV.

5.3.1.1.2. Each product (intermediate, by- or waste), distinguished by a clearly identifiable stage of processing or manufacture is indicated in a square or ellipse, the line joining any two, representing a production module. For example, in the figure below, product (or raw material) P1 follows the route of machinery M1 for product P2, M1 and M2 for product P3 and route M1 and M3 for product P4, the demand for M1, M2 and M3 arising out of capacity required for P2, P3 and P4 respectively. Any change in product/stage will signify a corresponding change in processing or manufacturing equipment stage.



5.3.1.1.3. Explanation of symbols:

Name of product or intermediate product and its code number arising from the production module leading up to it.

By-product and waste.
When the by-product or waste which materialises at the end of a production line is required to be shown separately from the product which identifies the production module/modules, it is shown in an ellipse which is joined with dotted lines to the box having full lines. The name of the by-product or waste product is written in the ellipse.

A production stage marking a point of distinction between production modules and not a product as such.

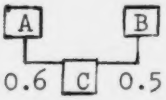
Production line representing the pool of machines for the product/or production stage at its end. In the case of more than one entry to the production line, they are all represented by dotted lines, only the principal production modules being represented by a full production line.

(1) Production lines representing either
    (a) production of by-products
        or
    (b) a stage of production which does not represent a product

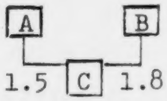
(2) Multiple production lines converging for production of a product.

Figures indicate the quantity of the material/ product at the beginning of the product line required for a unit production of the product at its base. When alternative process/ materials can be used to produce a product, the number is circled as shown in the example.

Ex.



0.6 units of A and 0.5 units of B are required for 1 unit of C.



1.5 units of A or 1.8 units of B are required for 1 unit of C.

5.3.1.2. Codification of production activities

A tree explaining the codification system is shown in the figure below. Codification of industrial sectors has been done according to four digit ISIC (International Standard Industrial Classification). A cumulative 9 digit coding system consisting of industry sector (4), product (1), production stage (2), technology (1), capacity (1) has been used.

CODE CELLS

1 2 3 4	9 9 9 9	Industry Sector ISIC
5	9	Product
6 7	9 9	Production stage
8	9	Technology
9	9	Capacity of critical equipment

For each production module, alternative technologies and capacities of the principal (critical) equipment which determines the capacity of a particular activity, are to be entered in a chart a sample of which is shown as Annex V. Notes on technology are to be attached as appendices to this chart.

An example of codification of production activities is given below:

Example:

3512 - Manufacture of Fertilisers and Pesticides

3512-3 - Sulphuric Acid

Production Module	Technology	Capacity of critical equipment
06 (for Sulphuric Acid)	I. Conversion and double absorption	(1) 2 x 43.75 t/h (2) 544 "

According to this coding system 351230612 activity code shows: Fertilisers and Pesticides (3512), Sulphuric acid (3), production stage, production of sulphuric acid (06), technology of conversion and double absorption (1) and a capacity of 544 t/h of the critical equipment (in this case a convertor). Generally the capacity is indicated in throughput per hour. When more than one input is required for a product, each requiring separate production module, a separate number is given for each. A production stage signifying an intermediate product may thus have more than one number each denoting a production module leading to it.

5.3.1.3. Since maximum of 9 products can be covered under each ISIC code addition 4 digit codes have to be assigned to such ISIC groups when the number of products exceeds nine. The product codes in 5 digits as evolved by the Capital Goods Project in Turkey is at Annex VI.

5.3.1.4. MODULAR PROCESS FLOW DIAGRAM AND PLANT SURVEY FORM

5.3.1.4.1. The diagram and the form record the process flow and relevant details of all equipment for EACH TECHNOLOGY-CAPACITY COMBINATION. The method of construction of the flow diagram is given below in para. 5.3.1.4.2. and the plant survey form shows actual details of all parameters considered relevant for codifying the particular equipment besides its mark, model, price in US$, date of purchase, estimated price of the equipment in 1980 and finally the 15 digit code for capital goods applicable to it. An example of the diagram is at Annex VII and a format for the plant survey is at Annex VIII.

5.3.1.4.2. Each production module shown in Modular Production Diagram (Para. 5.3.1.1. above) is blown up to show production activities identified according to alternative technology-capacity combinations. A Plant Survey Form and a process flow diagram is prepared as each production activity is identified. The flow diagram shows the process flow between the machines which are entered in the Plant Survey Form and the order in which they are required. The left hand side of the diagram form is for flow diagram and the right hand side for a list of the machines which are used in the process and other data related to the production activity.

The following symbols are used in the diagram:

○	Process	□	Inspection
⇧	Transport	⇧⃝	Combined process
———	Work flow	- - - -	Related activity
		▽	Storage

- The input and output of the production activity is shown according to the modular process chart.

- The numbers which are shown in the symbols are the serial numbers of the machines used. The same serial numbers are shown in the machine list on the left hand side of the form.

- The letters written on continuous or dotted lines are abbreviations used for showing the flow of goods. Serial numbers of machines are given according to their functions. Numbers 0-29 are for process, 30-39 for inspection, 40-59 for storage, 60-79 for transport functions, 80-89 for other machinery and equipment and 90-99 for auxiliary plants. In any one flow process sheet the numbers as a rule are not repeated. If the total number of items exceed the digits available, fresh series is started with a prefix 1. For example if there are more than 10 items falling under the heading "Other machinery and equipment" the 10th item will be number 89 and the 11th will be numbered 180.
- A 9 digit code at the top of the right hand side of the form is the code of the production activity.
- The capacity/hr. which is at the end of the right hand side is the capacity of the activity. The details of the capacity calculation are in the left hand bottom of the flow diagram. This indicates the name of the critical equipment, the design theoretical capacity per hour, the quantity of critical equipment and the design line capacity per hour, per shift, per day and per year. The design line capacity is calculated on the basis of an efficiency factor which is 0.9 for process equipment (90% utilisation) and 0.72 for other

equipment (90% utilisation factor and 80% operational factor).

- The industry name, product name, technology name and sample plant code are given at the end of the right hand side of the form.

5.4. Format in which targets for various subactivities may be recorded and monitored is at Annex IX.

5.5. DEMAND PROJECTION

5.5.1. Based on plant survey forms details of demand for each group of similar projected plant are entered in a format shown at the Tables in Vol. II. As will be seen these indicate: 15 digit code nos. and nomenclatures of capital goods and their demand projections in quantity, value and weight, year by year. Value as calculated in terms of US dollars with a selected base year, is entered from the plant survey forms.

5.6. COMPUTERISATION OF DEMAND

5.6.1. 15 DIGIT TOTALS

The first exercise is to make a computer file for each group of similar plants, arranged serially to show the demand for each code year by year, cost wise and weight wise. This is the basic data for all other work.

The next step is to get 15 digit totals for each industry and finally 15 digit totals for the country as a whole.

5.6.2. 5 DIGIT SUMMARIES

For the purpose of a quick grasp of the volume of demand, 5 digit summaries according to SITC code are computed, first for each group of similar plants, then for the industry and finally for the country as a whole.

5.6.3. AGGREGATION AND DEMAND CAPACITY BALANCES

5.6.3.1. All the codes worked out are subdivided between machines and fabricated equipment. In the cases of machines the aggregation is on the basis of number of each 15 digit code. The capacity data is also collected on the same basis, while in the case of fabricated equipment permutations and combinations of parameters of weight material and plate thickness are worked out.

5.6.3.2. Aggregation requires finally large computer facilities and their analysis requires a high degree of knowledge and experience of manufacture of different types and category of capital goods to determine which gaps can be met by modernisation and/or expansion of existing units, which items should continue to be imported and which justify investments in the shape of new projects.

Ind.Code 3512-1

Weight/Value

Page 1

EQUIPMENT REQUIREMENT FOR SONA FERTILIZER
COMPLEX, LOCATION: SONA
ANTICIPATED DATE OF COMMISSIONING 1987
CAPACITY: 300.000 1/3
FERTILIZER INDUSTRY, AMMONIA (FROM COAL)
BUNKERS, VESSELS TANKS, SEPARATORS DRUMS
GAS HOLDERS

UNIDO/SPO (AZOT)
CAPITAL GOODS
DEVELOPMENT PROJECT

SITC CODE	BASIC MACHINE NAME	Qty. Req'd (no)	Unit Weight (tons)	Unit cost in 1980 (US $ (1000)	YEARS										Total 1981-1990
					1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	
69211 0110012211	Intermediate bin	1	10.0	14.0					10.0						10.0
69211 0111321211	Feed bunker	16	2.0	1.4					32.0						32.0
69211 0111322211	Service bunker	16	7.1	5.0					113.0						113.0
69211 0120025211	Slag bunker	1	84.0	58.8					84.0						84.0
69211 0224025211	Coal dust bunker	2	100.0	70.6					200.0						200.0
69211 0230016211	Raw coal bunker	2	168.0	118.6					336.0						336.0
69211 0711022212	Storage vessel	1	8.0	65.4					8.0						8.0
69211 0111321211	Nitrogen vessel	4	3.8	3.8					14.4						14.4
69211 1311323211	Methanol sto. tank	2	10.2	20.0					20.4						20.4
69211 1322023211	Crude methanol tank	1	11.0	25.1					11.0						11.0
69211 1333323211	Methanol tank	1	20.0	57.6					20.0						20.0
69243 0217421212	NH_3 separator	1	0.25	5.9					0.25						0.25
69243 0217321222	NH_3 receiver	1	2.0	12.9					2.0						2.0
69243 0210321212	Condensate separator	2	1.0	12.9					2.0						2.0
69243 0210321212	Condensate separator	6	0.5	10.5					3.0						3.0
69243 0211524611	Flash drum	1	17.0	41.0					17.0						17.0
69243 0217424242	NH_3 separator	1	34.0	76.1					34.0						34.0
69243 0211021211	Reflux drum	1	1.4	45.7					1.4						1.4

CHAPTER VI

METHODOLOGY FOR GENERAL PURPOSE MACHINES

6.1. This chapter deals with the methodology to be followed for general purpose capital goods. Details of methodology followed for machine tools is given below. Similar approach has to be used for other general purpose machinery.

6.2. The basic characteristic of general purpose machinery from the point of view of programming of capital goods is that their demand has to be worked out on the basis of macrolevel indicators - as against a majority of equipment for, say, process industries and transport sector, the demand for which is entirely dependent on the growth rate of the particular industry.

6.3. TECHNIQUES FOR MACHINE TOOLS DEMAND FORECASTING

6.3.1. The forecasting models for machine tools demand mostly depend on the latter's relation with economic development of the country. A high demand is usually one of the most important indicators of economic growth. In most developing countries where the economy depends on agriculture the level of demand stays low.

6.3.2. The reliability of the techniques used for demand forecasting is closely related to the country's economic structure. Because of this, selection of forecasting methods becomes as important as selection of the most suitable indicators. The method to be used must recognize the current situation in a realistic way and also be able to reflect the effect of sudden changes that may take place in the economy.

6.3.3. Considering the present state of development of this industry in developing countries, the most important indicators that could be used for making the machine tool demand forecast are the past year's total demand and GNP. These two factors are closely related to each other and both of them generally show similar trends.

6.4. INVESTIGATION OF IMPORT FIGURES AND CONSUMPTION TREND

6.4.1. One indicator of machine tool's demand sometimes used is the quantity and type of the machines imported. These are used for projection of future demands. This is not considered relevant because a high import may in fact tend to saturate the market and lead to a reduced demand rather than an increased demand which would result from a straight projection of import figures to determine future demands. Similarly if a projection is made on the basis of very low imports in recent years, the machine tool demand will gradually decrease in the years to come. Either way, projections made only on the basis of imports will not realistically represent the future pattern of demand which must follow the anticipated pattern of economic development. Accordingly, import figures may be analysed ONLY to determine the TOTAL PAST CONSUMPTION of machine tools by individual types according to specification, both by quantity and value.

6.4.2. Machine tool demand is domestic production plus import.

6.4.3. RELATION BETWEEN GNP AND CONSUMPTION OF MACHINE TOOLS

6.4.3.1. In the "Machine Tool Industry" Publication of United Nations, economic structure and machine tool consumption of more than 80 countries has been studied and the results are shown in Table I by means of several economic indicators. Even though the correlation coefficient is higher for capital accumulation per capita, it may not be possible to use this because of difficulties in obtaining relevant data. With high correlation coefficient between GNP/capita and machine tool capita, GNP can be accepted as a logical indicator.

6.4.3.2. GNP per capita and machine tool consumption per capita should be plotted against time during the preceding 12-15 years. It will be observed that generally both of them follow similar trends.

Table 1

Relation between economic indicators and machine tool consumption

INDICATORS	Level of development	Simple corr. Coefficient	
		MIC tool cons. per capita	Industrial M/C tool cons./op.
GNP per capita	◩ + ☐	0.837 (80)	0.947 (84)
	☐	0.751 (55)	0.866 (57)
CAPITAL FORMATION PER CAPITA	◩ + ☐	0.886 (55)	0.936 (56)
BALANCE OF PAYMENT	◩ + ☐	0.396 (64)	0.294 (67)
VEHICLE IN USE/CAPITA	◩	0.648 (23)	0.803 (24)
	☐	0.622 (54)	0.765 (56)
PRODUCTION OF VEHIC./CAP.	◩ + ☐	0.648 (40)	0.640 (42)
POWER CONSUMP./CAPITA	◩ + ☐	0.659 (80)	0.823 (84)
% OF ACTIVE POPULATION	◩ + ☐	0.431 (75)	0.396 (76)
% OF POPULATION WORKING IN MANUFACTURING INDUSTRY	◩ + ☐	0.756 (73)	0.682 (73)
% OF ILLITERATE POPULATION	◩ + ☐	-0.474 (52)	-0.358 (52)
TOTAL POPULATION	◩ + ☐	0.111 (80)	0.066 (84)

◩ DEVELOPED COUNTRIES

☐ DEVELOPING COUNTRIES

Value in parenthesis is the number of countries studied.

6.5. DEMAND FORECASTING TECHNIQUE AND RESULTS

6.5.1. Each country faces its economic issues in the context of its own socio-economic environment. It is accordingly realistic to calculate correlation coefficient and trend equations by using actual data valid for each country. A comparison however should be made with figures for "Developing-Developed Countries" in U.N. statistics.

6.5.2. In order to understand the relationship between GNP and machine tool consumption and to use this relation to make demand forecasts for the future, first of all the machine tool consumption per capita during the previous 12-15 years should be studied. On the assumption that the total machine tool consumption is imports plus domestic production, the country's leading machine tool producers actual production figures should be found and their value calculated on the basis of a base-year dollar prices. The machine tool consumption during these years can be calculated by adding values for machine tool imports on the same basis. The machine tool consumption per capita can then be determined by dividing this value by population for each year.

6.5.3. As an example, in the case of Capital Goods Development Project in Turkey values of GNP per capita for the period 1967-80 were calculated on the basis of data taken from State Statistics Institute. These are shown in Table 2. In order to find the correlation coefficient and the linear relation between these two variables, regression method was used. How GNP per capita and Machine Tool consumption per capita affect each other can be explained by this simple equation:

$$y_1 = b+mx_1$$

where:

x_1 = GNP per capita on the ith year ($i=i_1 ....i_{18}$)
y_1 = Machine Tool consumption per capita on the ith year ($i=i_1 ....i_{18}$)
b = Intersection point
m = Slope coefficient

As a result of the regression made with the data of the years 1967-79

$$y = 0.689763022 + 0.00292359\ x$$

The correlation coefficient was found to be 0.7845993.

Table 2

Consumption of Machine Tools (1967-1980)

Year	Population (1000)	Machine tool consumption (1000 1968 $)			Consumption per capita (1968 $)
		Domestic Prod.	Imports	Total	
1967	32,750	568	9,457	10,025	0.3061069
1968	33,585	1,778	13,068	14,846	0.4420426
1969	34,442	1,010	9,891	10,901	0.3165031
1970	35,321	1,595	9,156	10,751	0.3043798
1971	36,215	3,197	11,971	15,168	0.4188320
1972	37,132	5,187	12,836	18,023	0.4853765
1973	38,072	6,554	14,095	20,549	0.5397405
1974	39,036	8,104	16,189	24,293	0.6223230
1975	40,025	9,709	22,223	31,932	0.7978014
1976	40,938	11,490	41,158	52,648	1.2860423
1977	41,871	13,957	29,920	43,877	1.0479091
1978	42,825	13,464	19,192	32,656	0.7625452
1979	43,801	12,384	15,554	47,938	0.6378393
1980	44,799	5,399	N.A.	N.A.	N.A.

6.5.4. In order to project the machine tool consumption figures to years 1982-2000, GNP values and population in these years were estimated. A 2.27% growth rate of population was assumed. Projections are shown in Table 3.

6.5.5. With the background of planning for full utilisation of installed capacity, two sets of projections were made for the "Turkish Model" used in this study - one with normally expected growth rate of GNP and the second with lower figures for calculating the absolute minimum demand. It was felt that where high levels of investment are involved, it would be better to have the initial capacity installed on the basis of the minimum demand and expand it as market conditions warrant.

6.5.6. Tables 4, 5 and 6 show the following forecast figures:

(i) Turkish model with normal growth rates
(ii) Turkish model for minimum demand
(iii) UNIDO "Developed and Developing Countries" model with normal growth rate.

6.5.7. The values calculated for Turkish conditions were very interestingly similar to the value for "Developing-Developed Countries" as shown in UNIDO's publication "Machine Tool Industry". A comparison of forecasts made by using UNIDO's equation for developing-developed countries with results of the "Turkish Model" as used in this study is shown in Table 7.

6.5.8. In order to make a clear representation of the results and also to evaluate them on the basis of current values all figures converted to 1980 base (US Dollar) are also shown in Table 7.

6.6. CLASSIFICATION AND CODIFICATION OF GENERAL PURPOSE

6.6.1. 15 digit code developed by Capital Goods Development Project in Turkey for all machine tools based on the 5 digit SITC codes have

Table 3

Gross National Product in Turkey (1967-1980)

Year	Population	GNP (1968 value)		Per capita GNP (US $)
		Million T.L.	1000 US $	
1967	32,750	105,461	11,614,648	354.6
1968	33,585	102,493	12,389,090	368.9
1969	34,442	118,594	13,061,006	279.2
1970	35,321	125,425	13,813,318	391.1
1971	36,215	138,185	15,218,604	420.2
1972	37,132	148,477	16,352,083	440.4
1973	38,072	156,458	17,231,048	452.6
1974	39,036	168,013	18,503,624	474.0
1975	40,025	181,383	19,976,090	499.0
1976	40,938	191,751	21,117,940	515.9
1977	41,871	203,358	22,396,243	534.9
1978	42,825	209,183	23,037,763	537.9
1979	43,801	208,343	22,945,252	523.8
1980	44,799	206,061	22,693,930	506.6

Table 4

Machine Tools Demand Forecast (1982-2000)
Turkish Model with Normal Growthrate
(1968 $ value)

Year	Population (1000)	GNP			MACHINE TOOLS	
		Growth Rate (%)	Value (1000 US $)	Per capita US $	Per capita US $	Value (1000 US $)
1982	46,864	4.5	24,758,624	528.3	0.8547741	40,058
1983	47,932	4.5	25,872,762	539.8	0.8883955	42,580
1984	49,025	4.5	27,037,036	551.5	0.92260168	45,230
1985	50.142	5.0	28,388,888	566.2	0.9655785	48,416
1986	51,280	6.0	30,092,221	586.8	1.0258047	52,603
1987	52,444	6.0	31,897,754	608.2	1.0883697	57,078
1988	53,635	6.0	33,811,619	630.4	1.1535736	61,855
1989	54,852	6.0	35,840,316	653.4	1.2205163	66,947
1990	56,097	6.0	37,990,735	677.4	1.2906827	72,403
1991	57,371	6.0	40,270,179	701.9	1.3623109	78,157
1992	58,673	6.0	42,686,390	727.5	1.4371550	84,322
1993	60,005	6.0	45,247,574	754.1	1.5149227	90,903
1994	61,367	6.0	47,962,428	781.6	1.5953217	97,900
1995	62,760	6.0	50,840,174	810.1	1.6786443	105,351
1996	64,185	6.0	53,890,584	839.6	1.7648904	113,279
1997	65,642	6.0	57,124,019	870.2	1.8543526	121,723
1998	67,132	6.0	60,551,460	902.0	1.9473230	130,727
1999	68,656	6.0	64,184,548	934.9	2.0435094	140,299
2000	70,214	6.0	68,035,621	970.4	2.1472971	150,770

Table 5

Machine Tools Demand Forecast (1982-2000)
Turkish Model for Minimum Demand
(1968 $ Value)

Year	Population (1000)	GNP			MACHINE TOOLS	
		Growth Rate (%)	Value (1000 US $)	Per capita US $	Per capita US $	Value (1000 US $)
1982	46,864	3.5	24,521,699	503.3	0.8401561	39,343
1983	47,932	3.5	25,379,959	529.5	0.8582825	41,139
1984	49,025	3.5	26,268,257	535.8	0.8767011	42,980
1985	50,142	3.5	27,187,646	542.2	0.8954122	44,898
1986	51,280	3.5	28,139,214	548.7	0.9144156	46,891
1987	52,444	3.5	29,124,086	555.3	0.9337113	48,967
1988	53,635	3.5	30,143,429	562.0	0.9532994	51,130
1989	54,852	3.5	31,198,449	568.8	0.9731799	53,381
1990	56,097	3.5	32,290,395	575.6	0.9931604	55,708
1991	57,371	3.5	33,420,559	582.5	1.0132332	58,130
1992	58,673	3.5	34,590,278	589.5	1.0336984	60,650
1993	60,005	3.5	35,800,938	596.6	1.0544559	63,273
1994	61,367	3.5	37,053,971	603.8	1.0755058	66,001
1995	62,760	3.5	38,350,860	611.1	1.0968481	68,838
1996	64,185	3.5	39,693,140	618.4	1.1181904	71,771
1997	65,642	3.5	41,082,400	625.9	1.1401174	74,840
1998	67,132	3.5	42,520,284	633.4	1.1620444	78,010
1999	68,656	3.5	44,008,494	641.0	1.1842637	81,307
2000	70,214	3.5	45,548,791	648.7	1.2067754	84,732

Table 6

Machine Tools Demand Forecast (1982-2000)

UNIDO Model for Developing + Developed Countries

$y = -0.25 + 0.0020x$

(1968 $ Value)

Year	Population (1000)	GNP			MACHINE TOOLS	
		Growth Rate (%)	Value (1000 US $)	Per capita US $	Per capita US $	Value (1000 US $)
1982	46,864	4.5	24,758,624	528.3	0.8066	37,801
1983	47,932	4.5	25,872,762	539.8	0.8296	39,764
1984	49,025	4.5	27,037,036	555.5	0.8530	41,818
1985	50,142	5.0	28,388,888	566.2	0.8824	44,245
1986	51,280	6.0	30,092,221	586.8	0.9236	47,362
1987	52,444	6.0	31,897,754	608.2	0.9664	50,682
1988	53,635	6.0	33,811,619	630.4	1.0108	54,214
1989	54,852	6.0	35,840,316	653.4	1.0568	57,968
1990	56,097	6.0	37,990,735	677.4	1.1048	61,976
1991	57,371	6.0	40,270,179	701.9	1.1538	66,195
1992	58,673	6.0	42,686,390	727.5	1.2050	70,701
1993	60,005	6.0	45,247,574	754.1	1.2582	75,498
1994	61,367	6.0	47,962,428	781.6	1.3132	80,857
1995	62,760	6.0	50,840,174	810.1	1.3702	85,980
1996	64,185	6.0	53,890,584	839.6	1.4292	91,733
1997	65,642	6.0	57,124,019	870.2	1.4904	97,833
1998	67,132	6.0	60,551,460	902.0	1.5540	104.323
1999	68,656	6.0	64,184,548	934.9	1.6198	111.209
2000	70,214	6.0	68,035,621	970.4	1.6908	118.718

Table 7

Machine Tools Demand Forecast 1982-2000

Comparison of Alternatives

Year	1968 Dollar Value (1000)			1980 Dollar Value (1000)		
	Turkish Model minimum growth	Turkish Model normal growth	UNIDO Model normal growth	Turkish Model minimum growth	Turkish Model normal growth	UNIDO Model normal growth
1982	39,373	40,058	37,801	104,023	105,833	99,870
1983	41,139	42,582	39,764	108,689	112,502	105,056
1984	42,980	45,230	41,818	113,553	119,498	110,483
1985	44,898	48,416	44,245	118,620	127,915	116,895
1986	46,891	52,603	47,362	123,886	139,028	125,130
1987	48,967	57,078	50,682	129,371	150,800	133,902
1988	51,130	61,855	54,214	135,085	163,421	143,233
1989	53,381	66,947	57,968	141,032	176,874	153,151
1990	55,708	72,403	61,976	147,181	191,289	163,741
1991	58,130	78,157	66,195	153,579	206,491	174,887
1992	60,650	84,322	70,701	160,237	222,779	186,792
1993	63,273	90,903	75,498	167,167	240,166	199,466
1994	66,001	97,900	80,587	174,375	258,652	212,910
1995	68,838	105,351	85,980	181,870	278,337	227,159
1996	71,771	113,279	91,733	189,619	299,283	242,359
1997	74,840	121,723	97,833	197,727	321,592	258,475
1998	78,010	130,727	104,323	206,102	345,381	275,621
1999	81,307	140,299	111,209	214,813	370,670	296,142
2000	84,732	150,770	118,718	223,862	398,334	313,653

been evolved as follows:

1 2 3 4 5	SITC Code
6 7	Basic machine nomenclature
8	Major specification (Cap.)
9	Major specification (Option)
10	Major specification (Option)
11	Type
12	Manufacturing characteristic (Weight)
13	Manufacturing characteristic (Main body material)
14	Manufacturing characteristic (Maximum component weight)
15	Origin

The first five digits indicate the basic machine group, 6th and 7th give the machine nomenclature. 8th, 9th and 10th indicate the major specifications, 11th gives the type, 12th, 13th and 14th manufacturing characteristics and the 15th shows if the machine is imported or manufactured indigenously.

6.6.2. All the 15 digit SITC codes as developed by the Capital Goods Project in Turkey including these general purpose machines are shown in Vol. II.

6.6.3. Frequently studies for machine tool demands are carried out on the basis of projections for broad groups of machines, each group containing not only different specifications of each category of machine tools but also machines of different types and categories. It is felt that it would be desirable to conduct this present study on the basis of SITC code suitably expanded to cover not only the individual categories of machine tools but also their specifications and broad manufacturing characteristics in line with formats evolved for machines for all other industries covered by the Project.

6.6.4. For the purpose of the initial macrolevel study, however, only the first 9 digits need be used - i.e. SITC code, basic machine, major specification (capacity) and one more specification. These adequately represent the depth to which it is necessary to pursue this research in the first instance. The balance of the codes can be used at the time of feasibility studies when more details are necessary to be recorded and analysed.

6.6.5. All the machines imported during the 12-15 year period chosen have to be detailed and coded up to 9 digits and this requires time-consuming deep research, in catalogues and files. In Turkey, after a detailed examination of output values, it was decided that the best way of expressing the results statistically would be in terms of averages for each year, for each machine tool as coded.

CHAPTER VII

METHODOLOGY FOR TRANSPORT SECTOR

7.1. The Capital Goods Project in Turkey covered only Railways out of the Transport sector. The methodology applied to Railways will however apply with suitable modifications to Air, Sea and Road transport.

7.2. METHODOLOGY AS APPLICABLE TO RAILWAYS

7.2.1. Railways being a service sector, the concepts of its codification to determine the patterns of demand of its principal capital goods-rolling stock including locomotives, passenger and freight cars are entirely different from those used for a manufacturing industry. One has to take into account pattern of traffic over individual sections for passengers as well as different types of goods, bearing in mind that the rolling stock required for different types of services and commodities are different. Locomotives may be electric, diesel or steam. Passenger cars may be of different classes and again for sitting, sleeping or catering, while freight cars may be covered, open or tank types with special designs for different commodities.

7.2.2. Methodologies which are generally used for working out requirements of rolling stock are either based on incremental traffic or global figures for overall traffic that the Railway system is expected to handle. The former suffers from a drawback that existing surplus or deficient capacities not only get hidden but get perpetuated. In the latter case, after overall requirements are worked out, the existing stock holdings are subtracted to arrive at the next assets to be procured. This is the more rational and scientific approach.

7.2.3. Traffic demand projections

The following steps may be followed:

(i) situation of POINT-TO-POINT traffic movement for each commodity, year-wise,

(ii) total of traffic demand in terms of Net Tons Kilometres

(iii) conversion of Traffic Demand in terms of Gross Ton Kilometres

(iv) distribution of Total Traffic Demand by type of traction (e.g. steam, diesel, electric)

7.2.4. Demand Projection of Rolling Stock

The next step is to arrive at the actual and proposed coefficients and norms for locomotives, passenger and freight cars in terms of units of traffic demand relevant to each type of service and traction. Formats have been designed to record historical figures, past trends and future projections in respect of not only the total traffic of different types of passenger and goods services but also norms of usage of locomotives, passenger cars and freight cars. These have to be compared with figures obtaining on other similar systems and pragmatic targets derived from each coefficient, keeping in view the present and anticipated constraints. These formats for locomotives, passenger cars and freight cars are shown on pages 49, 50 and 51.

7.2.5. Simultaneously, a study is necessary for the capacity for manufacture of rolling stock, constraints in its full utilisation and the likely gap between demand and supply.

7.2.6. REPLACEMENTS

Replacement of locomotives, coaches and wagons as they become unserviceable will constitute a sizeable portion of requirements. In the case of diesel locos, additionally, power packs will need to be provided - the average life of the power pack being 18 years.

7.2.7. Railways as a system

Movement of traffic by Railways is dependent not only on availability of rolling stock but also a number of other parameters

	Train kms (1000)					Loco kms/per loco per day					Loco hrs/Annum (1000)					Gross Ton kms per loco per day (1000)					Net Ton kms per loco per day (1000)				
Class of tractions / Year	1	2	3	6	8	1	2	3	6	8	1	2	3	6	8	1	2	3	6	8	1	2	3	6	8
1973																									
1974																									
1975																									
1976																									
1977																									
1978																									
1979																									
1980																									
1981																									
1982																									
1983																									
1984																									
1985																									
1986																									
1987																									
1988																									
1989																									
1990																									
1991																									
1992																									
1993																									
1994																									
1995																									

Coefficients for Freight Cars
for Service Code (Product
related to wagon types

PARAMETER	ORIGINATING TRAFFIC (MILL. TONNES)			NET TON KMS. (MILL.)			NET TON KMS/WAGON DAY	LEAD (KMS)	TURN ROUND (DAYS)
NATIONAL DISTRIBUTION	TOTAL	OUT OF WHICH RAILWAYS		TOTAL	OUT OF WHICH RAILWAYS				
USE / YEAR		1	2		1	2			

Capital Goods Development Project in Turkey

COEFFICIENTS - PASSENGER CARS

	Vehicle kms/Vehicle day		Axle kms		Passenger kms (million)		Originating passengers
Service	01	02	01	02	01	02	
Year \ Traction	4 5 7		4 5 7		4 5 7		
1973							
1974							
1975							
1976							
1977							
1978							
1979							
1980							
1981							
1982							
1983							
1984							
1985							
1986							
1987							
1988							
1989							
1990							
1991							
1992							
1993							
1994							
1995							

including condition of track, signals and telecommunication network, ability to book and load traffic and efficient operation of these interlinked disciplines AS A SYSTEM. Simultaneous action is necessary for developing the capabilities of the Railways in spheres other than manufacture of rolling stock. Utilisation of assets depends not only on their availability for service by adequate and timely repairs of rolling stock but a coordinated, management approach embracing all departments of Railways operation, making it possible for available assets to be optimally exploited.

7.3. A NATIONAL PLAN

A national plan for transport setting out priorities and plans between air, sea, roadways and railways for handling different types of traffic forms the basis of the plan of Railways. With the oil situation becoming increasingly difficult, a close and urgent look at this problem with a view to according a high priority to development of management and operational aspects of Railways to handle specified goods and commodities as well as passenger traffic appears to be called for in all developing countries. Additional facilities like containerisation, storage-cum-road distribution centres, could be thought of to improve the economic viability of movement by Railways of certain goods.

ANNEX I

Division	Major Group	Title of Category
		Major Division 1. Agriculture, Hunting, Forestry and Fishing
11		Agriculture and Hunting
	111	Agricultural and livestock production
	112	Agricultural services
	113	Hunting, trapping and game propagation
12		Forestry and logging
	121	Forestry
	122	Logging
13	130	Fishing
		Major Division 2. Mining and Quarrying
21	210	Coal Mining
22	220	Crude Petroleum and Natural Gas Production
23	230	Metal Ore Mining
29	290	Other Mining
		Major Division 3. Manufacturing
31		Manufacture of Food, Beverages and Tobacco
	311	Food manufacturing
	312	
	313	Beverage industries
	314	Tobacco manufacture
32		Textile, Wearing Apparel and Leather Industries
	321	Manufacture of textiles
	322	Manufacture of wearing apparel, except footwear
	323	Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel
	324	Manufacture of footwear, except vulcanized or moulded rubber or plastic footwear
33		Manufacture of wood and wood products, including furniture
	331	Manufacture of wood and wood and cork products, except furniture

	332	Manufacture of furniture and fixtures, except primarily of metal
34		Manufacture of Paper and Paper Products, Printing and Publishing
	341	Manufacture of paper and paper products
	342	Printing, publishing and allied industries
35		Manufacture of Chemicals and Chemical, Petroleum, Coal, Rubber and Plastic Products
	351	Manufacture of industrial chemicals
	352	Manufacture of other chemical products
	353	Petroleum refineries
	354	Manufacture of miscellaneous products of petroleum and coal
	355	Manufacture of rubber products
	356	Manufacture of plastic products not elsewhere classified
36		Manufacture of Non-Metallic Mineral Products, except Products of Petroleum and Coal
	361	Manufacture of pottery, china and earthenware
	362	Manufacture of glass and glass products
	369	Manufacture of other non-metallic mineral products
37		Basic Metal Industries
	371	Iron and steel basic industries
	372	Non-ferrous metal basic industries
38		Manufacture of Fabricated Metal Products, Machinery and Equipment
	381	Manufacture of fabricated metal products, except machinery and equipment
	382	Manufacture of machinery except electrical
	383	Manufacture of electrical machinery apparatus, appliances and supplies
	384	Manufacture of transport equipment
	385	Manufacture of professional and scientific and measuring and controlling equipment not elsewhere classified, and of photographic and optical goods

Division	Major Group	Title of Category
39	390	Other Manufacturing Industries
	Major Division 4. Electricity, Gas and Water	
41	410	Electricity, Gas and Steam
42	420	Water Works and Supply
	Major Division 5. Construction	
50	500	Construction
	Major Division 6. Wholesale and Retail Trade and Restaurants and Hotels	
61	610	Wholesale Trade
62	620	Retail Trade
63		Restaurants and Hotels
	631	Restaurants, cafes and other eating and drinking places
	632	Hotels, rooming houses, camps and other lodging places
	Major Division 7. Transport, Storage and Communication	
71		Transport and Storage
	711	Land transport
	712	Water transport
	713	Air transport
	719	Services allied to transport
72	720	Communication
	Major Division 8. Financing, Insurance, Real Estate and Business Services	
81	810	Financial Institutions
82	820	Insurance
83		Real Estate and Business Services
	831	Real estate
	832	Business services except machinery and equipment rental and leasing
	833	Machinery and equipment rental and leasing

Major Division 9. Community, Social and Personal Services

91	910	Public Administration and Defence
92	920	Sanitary and Similar Services
93		Social and Related Community Services
	931	Education services
	932	Research and scientific institutes
	933	Medical, dental, other health and veterinary services
	934	Welfare institutions
	935	Business, professional and labour associations
	939	Other social and related community services
94		Recreational and Cultural Services
	941	Motion picture and other entertainment services
	942	Libraries, museums, botanical and zoological gardens, and other cultural services not elsewhere classified
	949	Amusement and recreational services not elsewhere classified
95		Personal and Household Services
	951	Repair services not elsewhere classified
	952	Laundries, laundry services, and cleaning and dyeing plants
	953	Domestic services
	959	Miscellaneous personal services
96	960	International and Other Extra-Territorial Bodies

Major Division 0. Activities not Adequately Defined

0	000	Activities not adequately defined

ANNEX II

REFERENCE LIST OF MAJOR GROUPS OF INDUSTRIES FOR SELECTION OF PRIORITY SECTORS

111	Agricultural and livestock production
121	Forestry
122	Logging
130	Fishing
210	Coal Mining
220	Crude Petroleum and Natural Gas Production
290	Other Mining
311	Food Manufacturing
312	
313	Beverage industries
314	Tobacco manufactures
321	Manufacture of textiles
322	Manufacture of wearing apparel, except footwear
323	Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel
324	Manufacture of footwear, except vulcanized or moulded rubber or plastic footwear
331	Manufacture of wood and wood and cork products, except furniture
332	Manufacture of furniture and fixtures except primarily of metal

341	Manufacture of paper and paper products
342	Printing, publishing and allied industries
351	Manufacture of industrial chemicals
352	Manufacture of other chemical products
353	Petroleum refineries
354	Manufacture of miscellaneous products of petroleum and coal
355	Manufacture of rubber products
356	Manufacture of plastic products not elsewhere classified
361	Manufacture of pottery, china and earthenware
362	Manufacture of glass and glass products
369	Manufacture of other non-metallic mineral products
371	Iron and steel basic industries
372	Non-ferrous metal basic industries
381	Manufacture of fabricated metal products except machinery and equipment
382	Manufacture of machinery except electric
383	Manufacture of electrical machinery apparatus, appliances and supplies
384	Manufacture of professional and scientific and measuring and controlling equipment not elsewhere classified
385	Manufacture of professional and scientific and measuring and controlling equipment not elsewhere classified, and of photographic and optical goods
390	Other manufacturing industries

410	Electricity, Gas and Steam
420	Water works and supply
500	Construction
711	Land transport
712	Water transport
713	Air transport
720	Communication

ANNEX III

CAPITAL GOODS DEVELOPMENT PROGRAMME IN TURKEY
CAPACITY SURVEY FOR UNITS MANUFACTURING OR PROPOSING TO MANUFACTURE CAPITAL GOODS

PART I

(Note: New units which have not gone into production but are in the process of being set up are requested to give their information/projections against items marked "x" only).

(x) 1 - Province (See code enclosed)
(x) 2 - Date of filling questionnaire
(x) 3 - Telephone No.
(x) 4 - Name of firm
(x) 5 - Address
(x) 6 - Legal status (See code enclosed)
(x) 7 - Type of ownership (See code enclosed)
(x) 8 - Registration number with the Ministry of Industry
(x) 9 - Registration number with the Import and Export Department
(x) 10 - Date of start-up
(x) 11 - Authorised representative furnishing information

Name
Designation

(x) 12 - ISIC Code of Industry served (Refer to ISIC code)
(x) 13 - Capital composition (See code enclosed)
(x) 14 - Funds invested at the time of investment

Land
Buildings
Machinery and plant
Others

(x) 15 - Present Book Value

Land
Buildings
Machinery and plant
Others

(x) 16 - Source of capital (See code enclosed)
(x) 17 - Production incentive schemes (See code enclosed)

18 - Technical services

18.1. Indicate in chart form:

Machine Group	Number of machines	Monthly capacity in machine hours in 2 shifts	Load in machine hours on 1.1.1982	% machine hours lost due to breakdowns in 1981	% utilization	Reason for under-utilization

18.2. Source of jigs, fixtures and dies:

% by value

(i) Own design and manufacture
(ii) Turkish supplies
(iii) Imports

18.3. Give brief notes on organization charts of

(i) Industrial engineering department
(ii) Maintenance department
(iii) Quality control department

(x) 19 - Problems in achieving full capacity. (Please see code enclosed, number according to priority).

(x) 20 - Construction work 1980 1985 1990
Land
Covered area

21 - Indicate in chart form the installed capacity and actual production for each unit:

21.1. Fabricated equipment

	Production/installed capacity (in tons) for years		
SITC code 13th and 14th columns	1967	1981	1991

21.2. Iron casting

	Production/installed capacity (in tons) for years		
SITC Code	1967	1981	1991

21.3. Steel casting

	Production/installed capacity (in tons) for years		
SITC Code	1967	1981	1991

21.4. Steel forging

	Production/installed capacity (in tons) for years		
SITC Code	1967	1981	1991

21.5. Number of machines

			Years		
Machine name	Major Spec.	SITC Code	1967	1981	1991

(x) 22. Parameters of each product as codified (please refer to relevant code for capital goods as developed for Turkey)

1. Weight
2. Price

(x) 23. Foreign collaboration agreements if any.

24. A note on modernisation and rehabilitation of your plant if needed, desired or planned.

25. Limit factors

25.1. Foundries - max. weight of casting

25.1.1. Grey iron
25.1.2. Steel
25.1.3. Non-ferrous

25.2. Forge shops max. weight of forging

- Open foring
- Die-forging

25.3. Fabrication - Shops max.

Maximum thickness of steel
Maximum weight of single piece fabricated

25.4. Machine shop

Maximum weight of jobs handed on
Lathes
Planers
Milling machines

25.5. Heat treatment

Maximum dimensions handled
Maximum weight handled

26. Number of shifts operated.

27. Organisation chart.

28. Technology

28.1. Locally developed
28.2. Imported

28.2.1. Purchase of designs
28.2.2. Collaboration agreements

CAPACITY SURVEY FOR UNITS MANUFACTURING OR PROPOSING TO MANUFACTURE CAPITAL GOODS

PART II

(Note: New units which have not gone into production but are in the process of being set up are requested to give their information/projections against items marked "x" only).

1. Manpower

(x) 1.1. Personnel (past, present, anticipated).

	1970	1975	1980	1985	1990	1995
Production managers						
Production engineers						
Industrial engineers						
Quality control engineers						
Design engineers						
Technicians, supervisers						
Skilled workers						
Unskilled workers						
Part-time workers						
Non-engineering managers						
Non-technical staff						

1.2. Number of personnel lost by resignations, retirements, etc. in last 5 years.

(x) 1.3. Training schemes for managers and workers
(x) 1.4. Trade tests for workers
(x) 1.5. Chart showing personnel department

(x) 2. Technical and other services

(x) 2.1. Chart showing production planning and control department.
(x) 2.2. Chart showing stores procurement department.
(x) 2.3. Present/proposed system of inventory management.
(x) 2.4. Financial management
Costing and pricing policies and procedures. (Please give a brief note).
(x) 2.5. Chart showing marketing and sales organisations.

3. Structure of the plant (machinery - please indicate codes for capital goods codes wherever developed for Turkey).

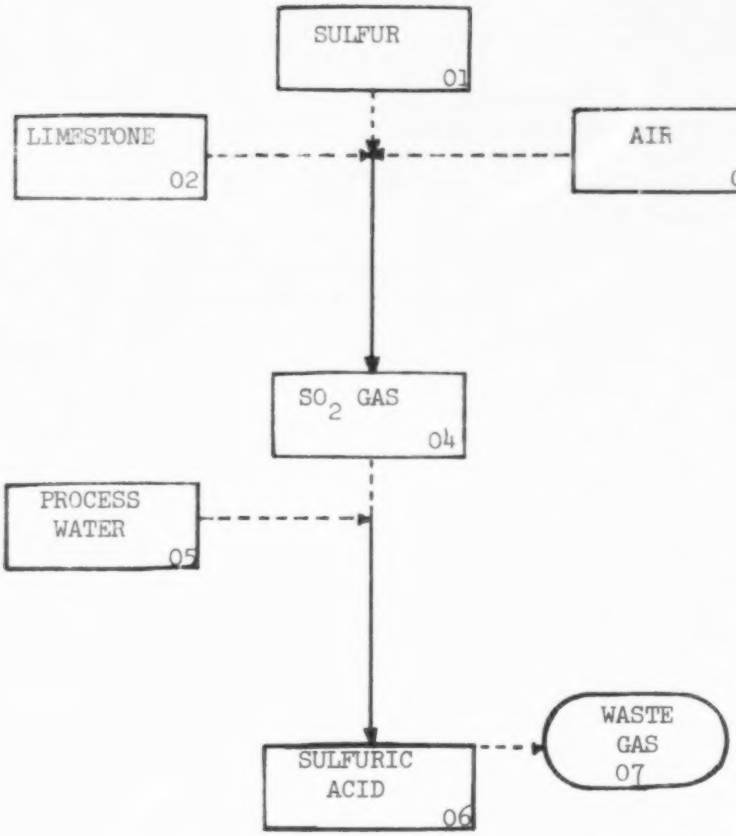
   Age group

   1. 0 - 5 years
   2. 6 - 10 years
   3. 11 - 20 years
   4. Over 20 years

(x) 4. Linkage with R and D organisations.
(x) 5. Exports past, present and projected.
(x) 6. Technology changes expected in user industry.
(x) 7. Degree of protection sought and how long.
(x) 8. Management information systems.

Production reports (Please give sample reports).
Financial control reports (Please give sample reports).

ANNEX IV


SULFUR
01
LIMESTONE
02
AIR
03
SO$_2$ GAS
04
PROCESS WATER
05
SULFURIC ACID
06
WASTE GAS
07

FERTILIZERS AND PESTICIDES SULFURIC ACID	INDUSTRY CODE 3512-3
UNIDO/SPO (AZOT) CAPITAL GOODS DEVELOPMENT PROJECT	
MODULAR PRODUCTION CHART	

ANNEX V

Ind. Code: 3512-3
Ind. Name: Fertilizer and Pesticides
SULFURIC ACID

UNIDO/SPO (AZOT)
CAPITAL GOODS DEVELOPMENT PROJECT

Prepared by Chem. Eng. BSc E. ABDELAL	Checked by UNIDO/Expert	Approved by UNIDO/CTA

INDUSTRY ACTIVITIES CHART

PRODUCTION STAGE		TECHNOLOGY		CRITICAL EQUIPMENT		DESIGN LINE CAPACITY	
CODE	NAME	CODE	NAME	NAME	CAPACITY RANGE	CODE	CAPACITY
01	Sulfur	-	-	-	-	1	2 x 15 t/h
						2	18 t/h
04	SO_2 gas	1	Sulfur burning	S Combustion chamber	125 m^3	1	2 x 95.460 m^3/h
						2	118.700 m^3/h
06	Sulfuric acid	1	Conversion and double absorption	Converter	737 m^3	1	2 x 43.75 t/h
						2	54.4 t/h

ANNEX VI

ISIC CODES FOR COMMODITIES

2100 - COAL MINING

2100-1 - Lignite
2100-2 - Coal

2301 - IRON ORE MINING

2301-1 - Iron ore

2302 - NON-FERROUS ORE MINING

2302-1 - Copper
2302-2 - Aluminium
2302-3 - Silver
2302-4 - Chromium
2302-5 - Tungsten
2302-6 - Uranium
2302-7 - Mercury
2302-8 - Lead and zinc
2302-9 - Antimony

2901 - STONE QUARRYING, CLAY AND SAND PITS

2901-1 - Limestone

2902 - CHEMICAL AND FERTILIZER MINERAL MINING

2902-1 - Phosphate
2902-2 - Baryte
2902-3 - Sulphur
2002-4 - Borate
2902-5 - Pyrita

2909 - MINING AND QUARRYING NOT ELSEWHERE CLASSIFIED

2909-1 - Perlite

3118 - SUGAR FACTORIES AND REFINERIES

3118-1 - Sugar

3411 - MANUFACTURE OF PULP AND PAPERBOARD

3411-1 - Printing and writing paper
3411-2 - Newsprint M.W.P. (Mechanical wood pulp)

3511 - MANUFACTURE OF BASIC INDUSTRIAL CHEMICALS EXCEPT FERTILIZERS

3511-1 - Caustic soda
3511-2 - Soda ash
3511-3 - Chlorine and HCL
3511-4 - Calcium carbide
3511-5 - Boric acid and boron compounds

3512 - MANUFACTURE OF FERTILIZER AND PESTICIDES

3512-1 - Ammonia from coal
3512-2 - Ammonia from naptha
3512-3 - Sulphuric Acid
3512-4 - DAP
3512-5 - Urea
3512-6 - Phosphoric Acid

3513 - MANUFACTURE OF SYNTHETIC RESINS, PLASTIC MATERIALS AND MAN-MADE FIBRES (EXCEPT GLASS)

3513-1 - (NSC) - Naptha steam cracking plant
3513-2 - (CA) - Chlorine-Alkali
3513-3 - (VCM) - Vinyl chloride monomer
3513-4 - (PVC) - Polyvinyl chloride
3513-5 - (PELD) - Polyethylene Low Density
3513-6 - (PEHD) - Polyethylene High Density
3513-7 - (PP) - Polypropylene
3513-8 - (STY) - Styrene
3513-9 - (PS) - Polystyrene

3514 - ADDITIONAL CODE FOR MANUFACTURE OF SYNTHETIC RESINS, PLASTIC MATERIALS AND MAN-MADE FIBRES (EXCEPT GLASS)

3514-1 - (ACN) - Acrylonitrite
3514-2 - (ABS) - Acrylonitrite Butadienstyrene
3514-3 - (SBR) - Styrene-Butadiene Rubber
3514-4 - (EO) - Ethylene Oxide
3514-5 - (EG) - Ethylene Glycol
3514-6 - (BDX) - Butadiene Expansion
3514-7 - (PTA) - Pure Terephthalic Acid
3514-8 - (M.A) - Methanol
3514-9 - (ARO) - Aromatics

3692 - **MANUFACTURE OF CEMENT, LIME AND PLASTER**

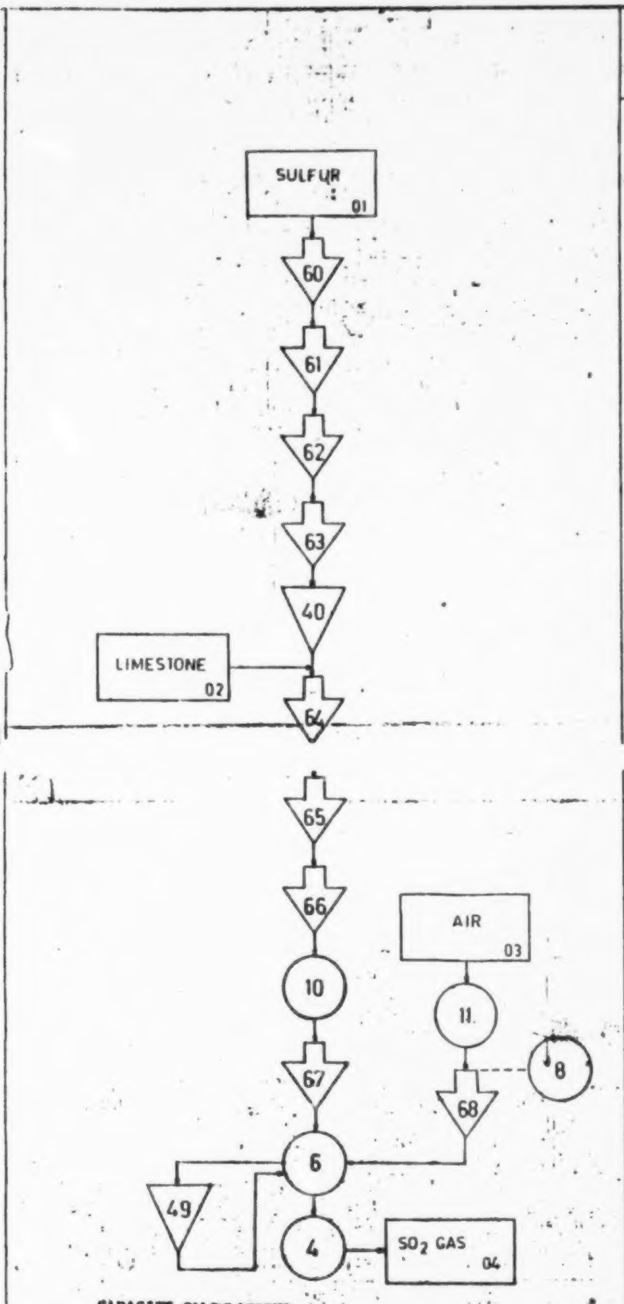
- 3692-1 - Portland cement

4101 - **ELECTRIC LIGHT AND POWER**

- 4101-0 - Light and Power, power generation transmission and distribution (Mechanical Part) - Non-electrical energy
- 4101-1 - Light and power, power generation, transmission and distribution - Electrical energy up to 3 KV
- 4101-2 - Electrical energy 6 KV
- 4101-3 - Electrical energy 10 KV
- 4101-4 - Electrical energy 15 KV
- 4101-5 - Electrical energy 25 KV
- 4101-6 - Electrical energy 30 KV
- 4101-7 - Electrical energy 60 KV
- 4101-8 - Electrical energy 150 KV
- 4101-9 - Electrical energy 380 KV

ANNEX VII

MODULAR PROCESS FLOW DIAGRAM



ACTIVITY CODE	INDUSTRY	PRODUCT	TECH	CAP
	3512	304	1	1

NO	MACHINE CODE	MACHINE NAME	QUAN
60	744260272013651	Belt conveyor	1
61	744260272014671	Belt conveyor	1
62	744260272013641	Belt conveyor	1
63	744280080022991	Tripper	1
40	692110111329211	Sulfur feed hopper	1
64	744260212011681	Belt conveyor	1
65	742200232622232	Filtration pump	2
66	742200231621212	Precoat pump	2
10	743623520003282	Sulfur filters	2
67	742200223628282	Sulfur burner feed pump	3
6	741322445008211	S combuction chamber	2
4	741610660014232	Waste heat boiler	2
49	692110214222212	Steam drum	2
68	743420061101212	Air Blower	2
11	743615080008182	Air filter	2
8	712610200212322	Turbine for blower	2

CAPACITY CALCULATIONS

Name of the critical equipment: S Combustion Chamber
Design capacity of the critical equipment per hour 15 t
No. of critical equipment : 2
Designed line capacity per hour : 2X95,460 m^3
Designed line capacity per shift: 2X763,680 m^3
Designed line capacity per day : 2X2,291,040 m^3
Designed line capacity per year : 2X687X10 m^3

UNIDO /SPO (AZOT)
CAPITAL GOODS DEVELOPMENT PROJECT
MODULAR PROCESS FLOW DIAGRAM

INDUSTRY	PRODUCT	TECHNOLOGY
FERTILIZER	SO_2 GAS	SULFUR BURNING
DATE	SAMPLE PLANT	CAPACITY
12.10.1981	—	$2 x 95\,460\ m^3/h$
PREPARED BY	DRAWN BY	CHECKED BY
EMINE ABDELAL OĞUZ KADIOĞLU	F. ARICIOGLU	V. MIHLADIZ

Checked by UNIDO/Expert | Approved by UNIDO/CTA

ANNEX VIII
ACTIVITY CODE 351230411

PLANT SURVEY FORM

r.	BASIC MACHINE NOMENCLATURE	MAJOR SPEC.	MAJOR SPEC. 1	MAJOR SPEC. s	TYPE DESCRIPTION	MANUFAC. CHARACT.1	MANUFAC. CHARACT. 2	MANUFAC. CHARACT.3	OR.	Q.	PURCHASE COST (1000 $)		CONSTANT 1980 YEAR CIST (1000 $)		YEAR OF PURCHASE AND REMARK	SITC CODE (FOR COMPUTER)									
											UNIT	TOTAL	UNIT	TOTAL		1 2 3 4 5	6 7	8	9	10	11	12	13	14	15
60	Belt conveyor	C: 600 t/h	W: 800 mm	L= 88 m	bulk	13.0 tons	C-Steel	12 tons	1	1	80	80	86	86	1979	74426	02	7	2	0	1	0	6	5	1
61	Belt conveyor	C: 600 t/h	W: 800 mm	L= 211 m	bulk	30.0 tons	C-Steel	27 tons	1	1	250	250	268	268	1979	74426	02	7	2	0	1	4	6	7	1
62	Belt conveyor	C: 600 t/h	W: 800 mm	L= 74 m	bulk	10.0 tons	C-Steel	9 tons	1	1	70	70	75	75	1979	74426	02	7	2	0	1	0	6	4	1
63	Tripper	C: 600 t/h	W: 800 mm	L= 90 m	travelling	15.0 tons	E 24-1	13 tons	1	1	91	91	97	97	1979	74428	00	8	0	0	2	0	9	5	1
40	Sulfur feed hopper	5 m^3	W: 1 m	25°C	cyl.	8.0 tons	C-Steel	6 mm	1	1	5.6	5.6	5.6	5.6	1980	69211	01	1	0	3	2	2	2	1	1
54	Belt conveyor	40 t/h	W: 500 mm	L= 10 m	bulk	0.5 tons	C-Steel	1.35 tons	1	1	10	10	10.7	10.7	1979	74426	02	1	2	0	1	1	6	10	1
65	Filtration pump	12m^3/h	H: 30 m	viscous	vertical	0.7 tons	Cast iron	0.5 tons	2	2	1.0	2	1.07	2.14	1979	74220	02	3	2	6	2	1	2	1	2
66	Precoat pump	50m^3/h	H: 15 m	viscous	vertical	0.7 tons	Cast iron	0.5 tons	2	2	1.2	2.4	1.28	2.56	1979	74220	02	3	1	6	2	1	2	1	2
[illegible]	Sulfur filters	15 t/h				1.5 tons	C-Steel	2.7 tons	2	2	10	20	10.7	21.5	1979	74362	31	2	0	0	0	1	2	1	2
67	Sulf.burner feed pump	8m^3/h	H: -0 m	viscous	vertical	1.0 tons	Cast iron	0.6 tons	2	3	1.1	3.3	1.17	3.51	1979	74220	02	2	3	6	2	1	2	1	2
6	S combustion chamber	Choice125m^3	1000°C	15 t/h S	1000°C	30.0 tons	C-Steel	20 mm	1	2	30	60	30	60	1980	74132	24	4	5	0	0	4	2	1	2
4	Waste heat boiler	1025 m^2	-	-	shell tube	40.0 tons	C-Steel	40 mm	2	2	200	400	200	400	1980	74161	06	6	0	0	2	4	2	3	2
49	Steam drum	10 m^3				5.0 tons	C-Steel	30 mm	2	2	35	70	35	70	1980	69233	02	1	4	2	2	2	2	2	2
68	Air blower	1600m^3/min	H: 49 m	air		3.0 tons	Cast iron	2.8 tons	2	2	170	340	183	367	1979	74342	00	6	1	1	0	1	2	3	2
[illegible]	Air filter	1600m^3/min				5.0 tons	Mild steel	-	2	2	48	96	48	96	1980	74361	50	8	0	0	0	2	1	2	2
9	Turbine for blower			40 kg/cm^2	back pressure	5.0 tons	Alloy iron	4.7 tons	2	2	10	20	10	20	1980	71261	02	0	0	2	3	2	3	2	2

ANNEX IX

TIME-TABLE FOR PRE-FEASIBILITY ACTIVITIES
PROCESS INDUSTRIES

SECTOR:

AGENCY:

	COMPLETION DATE	
ACTIVITY	TARGET	ACTUAL
1. Classification and codification		
1.1. Classification and codification of user industries		
1.2. Classification and codification of capital goods		
1.3. Quantity and price coefficients for standard plant capacities/capital goods as codified for industry present and future		
1.4. Quantity and price coefficients for standard plant capacities/in terms of technical data for manufacture of capital goods.		
2. Commodity demand survey		
2.1. Projections of domestic demand for commodity year by year		
2.2. Projection of demand for export		
Commodity supply projection		
3.1. Anticipated supply, year by year, from existing units (i) with modernisation and rehabilitation (ii) with expansion		

	COMPLETION DATE	
	TARGET	ACTUAL
3.2. Anticipated supply from new projects, year by year		
(i) Sanctioned		
(ii) Approved		
(iii) Planned		
Demand survey for capital goods in financial and physical terms for each codified item year by year (ref. item 1.4. above).		
4.1. Anticipated demand for new projects		
(i) Sanctioned projects		
(ii) Approved projects		
(iii) Planned projects		
4.2. Anticipated demand for renewals and replacement		
4.3. Demand for exports		
4.4. Aggregation of domestic demand in financial and physical terms for each codified item within other user industries		
5. Capacity survey for capital goods		
5.1. Capacity survey, year by year for each codified item in financial and physical terms.		
(i) Questionnaire completion (field visits)		
(ii) Analysis and discussions with management		

	COMPLETION DATE	
	TARGET	ACTUAL
5.2. Detailed proposals for modernisation and rehabilitation of existing units and their expected capacity for each codified item in financial and physical terms as a result, year by year.		
5.3. List of proposals for expansion and expected capacity, for each codified item in financial and physical terms, year by year.		
5.4. Expected capacity from new projects for each codified item in financial and physical terms, year by year. (i) Sanctioned (ii) Approved (iii) Planned		
5.5. Anticipated gap for each codified item in financial and physical terms, year by year.		

MANUAL FOR PLANNING OF
CAPITAL GOODS INDUSTRY

VOL. II

CLASSIFICATION OF STEEL FORGINGS

SITC GROUP	MATERIAL	CRITERIA 1 WEIGHT	TYPE
67930	1. Carbon steels 2. Alloy steels 3. High alloy steels	1. Less than 3 kg. 2. 3-10 kg. 3. 10-40 kg. 4. 40-100 kg. 5. 100-500 kg. 6. 500-1000 kg. 7. 1000-5000 kg. 8. 5000-10000 kg. 9. More than 10000 kg.	1. Open forging 2. Die forging

UNITED NATIONS DEVELOPMENT PROGRAMME IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

CLASSIFICATION OF IRON CASTINGS

SITC GROUP	MATERIAL	CRITERIA 1 WEIGHT	CRITERIA 2 COMPLEXITY
67941	1. Chilled 2. Grey Iron 3. Alloyed iron 4. Malleable 5. Spheroidal	1. Less than 3 kg. 2. 3-10 kg. 3. 10-40 kg. 4. 40-100 kg. 5. 100-500 kg. 6. 500-1000 kg. 7. 1000-5000 kg. 8. 5000-10000 kg. 9. More than 10000 kg.	1. Shaped, highly complex 2. Shaped, medium and low complexity 3. Centrifugal 4. Others

UNITED NATIONS DEVELOPMENT PROGRAMME IN TURKEY

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

CLASSIFICATION OF STEEL CASTING

SITC GROUP	MATERIAL	CRITERIA 1 WEIGHT	CRITERIA 2 COMPLEXITY
67942	1. Carbon steels 2. Alloy steels 3. High alloy steels	1. Less than 3 kg. 2. 3-10 kg. 3. 10-40 kg. 4. 40-100 kg. 5. 100-500 kg. 6. 500-1000 kg. 7. 1000-5000 kg. 8. 5000-10000 kg. 9. More than 10000 kg.	1. Shaped, highly complex 2. Shaped, medium and low complexity 3. Centrifugal 4. Others

SITC Code 69211 - Reservoirs, tanks, vats and similar containers for any material (other than compressed or liquified gas) of iron or steel of a capacity exceeding 300 lt., whether or not lined or heat-insulated but, not fitted with mechanical or thermal equipments.

6-7		8		9		10		11		12		13		14		15	
Basi	achine Nomenclature	Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Cubic meters (m^3)	Code	Diameter in meters (m)	Code	Temperature °C	Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
01	s	1	Upto 100	1	Upto 5	1	Above 500	1	Rectangular/ cubic	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
02	kers	2	100-500	2	5-7.5	2	500-100			2	5-10			2	20-40	2	Imported
03	es	3	500-1000	3	7.5-10	3	100-0	2	Circular/ cylindrical semi-cylindrical elliptical	3	10-25			3	40-50		
04	ners	4	1000-2500	4	Over 10	4	0-(-25)			4	25-50			4	Over 50		
05	rvoirs	5	2500-7500			5	(-25)-(-50)			5	50-100	2	Carbon steel above 0.20 C tested quality				
06	s	6	7500-15000			6	(-50)-(-100)			6	100-200						
07	ks	7	15000-30000			7	(-100)-(-120)			7	200-300						
08	s	8	30000-50000			8	(-120)-(-170)	3	Spherical	8	300-500	3	Boiler steel				
09	s	9	Over 50000			9	Below (-170)			9	Over 500	4	Alloy steel				
10	sels											5	High alloy steel				
11	ble-walled vessels																
12	ed vessels											6	Stainless steel				
13	rage tanks											7	Non-ferrous materials				
14	pers							9	Others								
99	ers,											9	Others				

SITC Code 69241 - Casks, drums, cans, boxes and similar containers of sheet or plate iron or steel of a description commonly used for the conveyance or packing of goods.

6-7		8		9		10		11		12		13		14		15	
Ba	Machine Nomenclature	Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Cubic meters (m^3)	Code		Code	Temperature °C	Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
01	xes	1	Upto 10			1	Above 500	1	Rectangular/ cubic	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
02	ns	2	10-25			2	500-100	2	Circular cylindrical, semi-cylindrical, elliptical	2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
03	sks	3	25-50			3	100-0	3	Spherical	3	10-25	3	Boiler steel	3	40-50		
04	ntainers	4	50-75			4	0-(-25)			4	25-50	4	Alloy steel	4	Over 50		
05	ums	5	75-100			5	(-25)-(-50)			5	50-100	5	High alloy steel				
06	ssels	6	100-150			6	(-50)-(-100)			6	100-200	6	Stainless steel				
07	ssels (lined)	7	150-200			7	(-100)-(-120)			7	200-300	7	Non-ferrous materials				
08	ts	8	200-300			8	(-120)-(-170)			8	300-500						
99	hers	9	Over 300			9	Below (-170)	9	Others	9	Over 500	9	Others				

SITC Code 69243 - Containers of iron or steel for compressed or liquified gas

6-7	8		9		10		11		12		13		14		15
sic Machine Nomenclature	Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin
Name	Code	Cubic meters (m^3)	Code	Pressure kg/cm^2	Code	Temperature °C	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
Containers	1	Upto 100	1	Upto 10	1	Above 500	1	Rectangular/ cubic	1	Upto 5	1	Mild steel upto 0,20 carbon (untested quality)	1	Upto 20	1	Turkey
Drums	2	100-500	2	10-20	2	500-100	2	Circular cylindrical, elliptical, semi-cylindrical	2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
Gas holder	3	500-1000	3	20-30	3	100-0	3	Spherical	3	10-25	3	Boiler steel	3	40-50		
Tanks	4	1000-2500	4	30-50	4	0-(-25)	4	Telescopic	4	25-50	4	Alloy steel	4	Over 50		
Vessels	5	2500-7500	5	50-75	5	(-25)-(-50)			5	50-100	5	High alloy steel				
Double-walled-vessels	6	7500-15000	6	75-100	6	(-50)-(-100)			6	100-200	6	Stainless steel				
Lined-vessels	7	15000-30000	7	100-150	7	(-100)-(-120)			7	200-300	7	Non-ferrous materials				
	8	30000-50000	8	150-200	8	(-120)-(-170)			8	300-500						
Others	9	Over 50000	9	Above 200	9	Below (-170)	9	Others	9	Over 500	9	Others				

SITC Code 711.11 - Steam and other vapour,generating boilers
- STEAM BOILERS FOR POWER PLANTS AND USER INDUSTRIES

6-7		8		9		10		11		12		13		14		15
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin
Code	Name	Code	Output t/h	Code	Pressure (kg/cm^2)	Code	Temperature ($^{\circ}$C)	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code
00	**Natural circulation boilers**	1	Upto 25	1	Upto 50	1	Upto 200	1	Bituminous coal fired	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1 Turkey
		2	25-50	2	50-100	2	200-300			2	5-10			2	20-40	2 Importe
10	**Once-through boilers**	3	50-100	3	100-150	3	300-400	2	Brown coal fired	3	10-25			3	40-50	
11	Subcritical boilers	4	100-200	4	150-200	4	400-450			4	25-50			4	Over 50	
12	Supercritical boilers	5	200-300	5	200-250	5	450-500	3	Lignite fired	5	50-100					
		6	300-500	6	250-300	6	500-550	4	Fuel oil fired	6	100-200	2	Carbon steel above 0.20 C tested quality			
20	**Controlled circulation boilers**	7	500-1000	7	Over 300	7	Over 550	5	Natural gas fired	7	200-300					
		8	1000-2000							8	300-500					
30	**Mono-tube boilers**	9	Over 2000					6	Sulphite liquor fired	9	Over 500	3	Boiler steel			
99	Others							7	Combined fired			4	Alloy steel			
								8	Waste fired			5	High alloy steel			
								9	Others			6	Stainless steel			
												7	Non-ferrous materials			
												9	Others			

SITC Code 711.21 - Auxiliary plant for use with boilers
- AIR PREHEATERS

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity (m^3/h)	Code	Heating surface (m^2)	Code		Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	/
00	Regenerative air preheaters	1	Upto 100	1	Upto 20			1	Rotary type air heater	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
		2	100-200	2	20-50			2	Tubular type air heater	2	5-10	2	Carbon steel above 0.20 C tested quality.	2	20-40	2	Importo
10	Recuperative air preheaters	3	200-400	3	50-100			3	Plate type air heater	3	10-25	3	Boiler steel	3	40-50		
		4	400-600	4	100-150			4	Steam air heater	4	25-50	4	Alloy steel	4	Over 50		
99	Others	5	600-800	5	150-200					5	50-100	5	High alloy steel				
		6	800-1000	6	200-250					6	100-200	6	Stainless steel				
		7	1000-1500	7	250-300					7	200-300	7	Non-ferrous materials				
		8	1500-2000	8	300-400					8	300-500						
		9	Over 2000	9	Over 400			9	Others	9	Over 500	9	Others				

SITC Code 711.22 - Auxiliary plant for use with boilers
- SOOTREMOVERS

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Medium flow (Tons/h)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Sootblowers	1	Upto 1					1	Water	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Retrocable sootblowers	2	1-2					2	Steam	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	2-3					3	Water-steam	3	10-25	3	Alloy iron casting	3	2-5		
		4	3-5							4	25-50	4	Malleable iron casting	4	5-10		
		5	5-7							5	50-100	5	Spheroidal iron casting	5	10-15		
		6	7-10							6	100-200	6	Carbon steel casting	6	15-25		
		7	Over 10							7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
										9	Over 500	9	Steel fabrication	9	Over 100		
99	Others																

SITC Code 712.61 - Steam and other vapour units, not incorporating boilers

- STEAM TURBINE FOR POWER GENERATION AND PROCESS INDUSTRIES

6-7		8	9	10	11	12	13	14	15
Basic Machine Nomenclature		Major Specification (Capacity)	Major Spec.-1 Optional	Major Spec.-2 Optional	Type	Manufacturing characteristic -1	Manufacturing characteristic -2	Manufacturing characteristic -3	Origin
Code	Name	Code Output (MW)	Code Speed (RPM)	Code Steam inlet pressure (kg/cm^2)	Code Description	Code Weight(tons)	Code Main body material	Code Max. Component Weight(tons)	Code
00	**Single-cylinder steam turbines**	1.Upto 5	1.Upto 166.7	1.Upto 20	1.Impulse	1.Upto 5	1.Chilled iron casting	1.Upto 1	1.Turkey
01	Condensing turbines	2.5-20	2.166.7-300	2.20-50	2.Reaction	2.5-10	2.Grey iron casting	2.1-2	2.Imported
02	Back pressure turbines	3.20-50	3.300-375	3.50-100	3.Combined	3.10-25	3.Alloy iron casting	3.2-5	
03	Extraction turbines	4.50-100	4.375-500	4.100-150		4.25-50	4.Malleable iron casting	4.5-10	
04	Turbines with automatic steam extraction and back pressure	5.100-150	5.500-750	5.150-200		5.50-100	5.Spheroidal iron casting	5.10-15	
		6.150-200	6.750-1000	6.200-250		6.100-200	6.Carbon steel casting	6.15-25	
		7.200-300	7.1000-1500	7.250-300		7.200-300	7.Alloy steel casting	7.25-	
10	**Multi-cylinder steam turbines**	8.300-600	8.1500-3000	8.Over 300		8.300-500	8.Non-ferrous casting	8.50-10	
11	Condensing turbines	9.Over 600	9.Over 3000		9.Others	9.Over 500	9.Steel fabrication	9.Over 100	
12	Back pressure turbines								
13	Extraction turbines								
14	Turbines with automatic steam extraction and back pressure								
99	Others								

SITC Code 712.62 - Condensers for steam turbine.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (t/h)	Code	Heating surface (m^2)	Code	Cooling water pressure (kg/cm^2)	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
00	Surface compound condensers	1	Upto 75	1	Upto 500	1	Upto 5	1	With vacuum pump	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
		2	75-100	2	500-1000	2	5-10	2	With vacuum ejector	2	5-10	2	Carbon steel above 0,20 C tested quality	2	20-40	2	Imported
		3	100-150	3	1000-2000	3	10-25			3	10-25	3	Boiler steel	3	40-50		
		4	150-300	4	2000-3000	4	25-50			4	25-50	4	Alloy steel	4	Over 50		
		5	300-500	5	3000-5000	5	50-100			5	50-100	5	High alloy steel				
		6	500-750	6	5000-10000	6	100-200			6	100-200	6	Stainless steel				
		7	750-900	7	10000-20000	7	200-300			7	200-300	7	Non-ferrous materials				
		8	900-1000	8	20000-50000	8	300-500			8	300-500						
		9	Over 1000	9	Over 50000	9	Over 500	9	Others	9	Over 500	9	Others				

SITC Code 713.20 - Internal combustion engines for propelling vehicles of division 78, groups 722 and 723 and items 744.11 and 951.01.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Spec. (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing Characteristic 1		Manufacturing Characteristic 2		Manufacturing Characteristic 3		Origin	
Code	Name	Code	Power range (HP)	Code	Displacement (Liter)	Code	No. of cylinder	Code	Description	Code	Weight (Tons)	Code	Main body material	Code	Max. component weight (Tons)	Code	
01	Engines for road vehicles of division 78	1	Upto 40	1	Upto 1	1	1	1	Gasoline	1 1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Engines for tractors defined in group 722	2	40-70	2	1-2	2	2	2	Diesel	2 2	5-10	2	Grey iron casting	2	1-2	2	Imported
03	Engines for construction and mining machinery defined in group 723	3	70-100	3	2-3	3	3			3 3	10-25	3	Alloy iron casting	3	2-5		
04	Engines for works trucks defined in item 744.11	4	100-150	4	3-4	4	4			4 4	25-50	4	Malleable iron casting	4	5-10		
05	Engines for armoured vehicles defined in item 951.01	5	150-200	5	4-6	5	5			5 5	50-100	5	Spheroidal iron casting	5	10-15		
99	Others	6	200-250	6	6-8	6	6			6 6	100-200	6	Carbon steel casting	6	15-25		
		7	250-350	7	8-12	7	8			7 7	200-300	7	Alloy steel casting	7	25-50		
		8	350-550	8	12-16	8	10			8 8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 550	9	Over 16	9	12 and more			9 9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 714.88 - Other gas turbines, n.e.s.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Rated output (MW)	Code	Speed (r.p.m.)	Code	Number of combustors	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Peak load turbines (1 to 5 hrs per start, 100-200 starts per year)	1	Upto 5	1	Upto 3000	1	1	1	Open cycle	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	5-20	2	3000-4000	2	2	2	Closed cycle	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	20-50	3	4000-5000			3	Air storage	3	10-25	3	Alloy iron casting	3	2-5		
		4	50-100	4	5000-6000			4	Free piston	4	25-50	4	Malleable iron casting	4	5-10		
10	Medium load turbines (5-10 hrs per start, 250 starts per year)	5	100-200	5	Over 6000					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	200-300							6	100-200	6	Carbon steel casting	6	15-25		
		7	Over 300							7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
20	Base load turbines (Over 10 hrs per start)									9	Over 500	9	Steel fabrication	9	Over 100		
99	Others																

SITC Code 716.11 - Motors and Generators, Direct Current

ELECTRIC MOTORS, D.C.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origi	
Code	Name	Code	Power (KW)	Code	Speed (RPM)	Code	Voltage (V)	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	D-C Series Motors	1	Upto 10	1	Upto 300	1	Upto 500	1	Open	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	10-50	2	300-375	2	500-3000	2	Closed	2	5-10	2	Grey iron casting	2	1-2	2	Import
10	D-C Shunt Motors	3	50-100	3	375-500	3	3000-6000	3	Gas proof	3	10-25	3	Alloy iron casting	3	2-5		
		4	100-200	4	500-750	4	Over 6000	4	Flame proof	4	25-50	4	Malleable iron casting	4	5-10		
20	D-C Compound or Cumulative Motors	5	200-300	5	750-1000			5	High ambient temp. proof	5	50-100	5	Spheroidal iron casting	5	10-15		
		6	300-500	6	1000-1500			6	Water proof	6	100-200	6	Carbon steel casting	6	15-25		
30	D-C Differential Motors	7	500-1000	7	1500-3000					7	200-300	7	Alloy steel casting	7	25-50		
		8	1000-3000	8	Over 3000					8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 3000					9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
99	Others																

SITC Code 716.12 - Motors and Generators, DIRECT CURRENT-ELECTRIC GENERATORS, D.C.

6-7 Basic Machine Nomenclature		8 Major Specification (Capacity)		9 Major Spec.-1 Optional		10 Major Spec.-2 Optional		11 Type		12 Manufacturing characteristic -1		13 Manufacturing characteristic -2		14 Manufacturing characteristic -3		15 Origin	
Code	Name	Code	Power (KW)	Code	Speed (RPM)	Code	Voltage (V)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	DC-Series generators	1.	Upto 10	1.	Upto 300	1.	Upto 500	1.	Open	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
10	Self-excited shunt generators	2.	10-50	2.	300-375	2.	500-3000	2.	Closed	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
20	Separately excited generators	3.	50-100	3.	375-500	3.	3000-6000	3.	Gas proof	3.	10-25	3.	Alloy iron casting	3.	2-5		
30	Compound-wound generators	4.	100-200	4.	500-750	4.	Over 6000	4.	Flame proof	4.	25-50	4.	Malleable iron casting	4.	5-10		
40	Commutating pole or interpole generators	5.	200-300	5.	750-1000			5.	High ambient temp. proof	5.	50-100	5.	Spheroidal iron casting	5.	10-15		
99	Others	6.	300-500	6.	1000-1500			6.	Water proof	6.	100-200	6.	Carbon steel casting	6.	15-25		
		7.	500-1000	7.	1500-3000					7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	1000-3000	8.	Over 3000					8.	300-500	8.	Non-ferrous casting	8.	50-100		
		9.	Over 3000					9.	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		

SITC Code 716.21 - ELECTRIC MOTORS (INCLUDING UNIVERSAL AC/DC MOTORS),
OTHERS THAN DIRECT CURRENT

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Power (KW)	Code	Synchronous speed (RPM)	Code	Voltage (V)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Polyphase synchronous motors	1	Upto 10	1	Upto 375	1	Upto 500	1	Open	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	10-50	2	600	2	500-3000	2	Closed	2	5-10			2	1-2	2	Imported
		3	50-100	3	750	3	3000-6000	3	Gas proof	3	10-25	2	Grey iron casting	3	2-5		
10	Singlephase Synchronous motors	4	100-200	4	1000	4	Over 6000	4	Flame proof	4	25-50			4	5-10		
		5	200-300	5	1500			5	High ambient temp. proof	5	50-100	3	Alloy iron casting	5	10-15		
		6	300-500	6	3000					6	100-200			6	15-25		
20	Polyphase Asyhchronous motors	7	500-1000	7	Over 3000			6	Water proof	7	200-300	4	Malleable iron casting	7	25-50		
		8	1000-3000							8	300-500			8	50-100		
21	Slip-ring induction motors	9	Over 3000							9	Over 500	5	Spheroidal iron casting	9	Over 100		
22	Squirel cage induction motors							9	Others								
												6	Carbon steel casting				
30	Single phase induction motors											7	Alloy steel casting				
31	Plain motors											8	Non-ferrous casting				
32	Shaded-pole motors																
33	Split-phase motors											9	Steel fabrication				
34	Capacitor split-phase motors																
35	Two-speed motors																
36	Asymmetric cage motors																
40	Polyphase commutator motors																
41	Schrage motors																
42	Doubly-fed motors																

SITC Code 716.21 - ELECTRIC MOTORS(INCLUDING UNIVERSAL AC/DC MOTORS), OTHERS THAN DIRECT CURRENT

Machines

6-7	8	9	10	11	12	13	14	15
Basic Machine Nomenclature	Major Spec. (Capacity)	Major Spec.1 Optional	Major Spec.2 Optional	Type	Manufacturing characteristic 1	Manufacturing characteristic 2	Manufacturing characteristic 3	Origin
Name	Power(KW)	Synchronous speed(RPM)	Voltage (V)	Descrip.	Weight (Tons)	Main body material	Max. component weight(tons)	
50 Single phase commutator motors	1 Upto 10	1 Upto 375	1 Upto 500	1 Open	1 Upto 5	1 Chilled iron casting	1 Upto 1	1 Turkey
51 Universal motors	2 10-50	2 600	2 500-3000	2 Closed	2 5-10	2 Grey iron casting	2 1-2	2 Imported
52 Series motors	3 50-100	3 750	3 3000-6000	3 Gas proof	3 10-25	3 Alloy iron casting	3 2-5	
53 Neutralized series motors	4 100-200	4 1000	4 Over 6000	4 Flame proof	4 25-50	4 Malleable iron casting	4 5-10	
54 Repulison motors	5 200-300	5 1500		5 High ambient temp. proof	5 50-100	5 Spheroidal iron casting	5 10-15	
55 Repulsion-induction motors	6 300-500	6 3000		6 Water-proof	6 100-200	6 Carbon steel casting	6 15-25	
60 Reluctance motors	7 500-1000	7 Over 3000		9 Others	7 200-300	7 Alloy steel casting	7 25-50	
61 Polyphase reluctance motors	8 1000-3000				8 300-500	8 Non-ferrous casting	8 50-100	
62 Hysteresis motors	9 Over 3000				9 Over 500	9 Steel fabrication	9 Over 100	
63 Hysteresis/ reluctance motors								
70 Special motors								
71 Permanent magnet motors								
72 Servo control motors (Synchronous, stepper motors)								
73 Power control motors(Selsyns)								
74 Doubly-fed induction motors								
75 Linear motors								

SITC Code 716.22 - Generators, ALTERNING CURRENT

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (MW)	Code	Synchronous Speed (RPM)	Code	Voltage (KV)	Code	Description Cooling system	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Cylindrical rotor-synchronous generators	1	Upto 5	1	Upto 166.7	1	Upto 3	1	Air	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	5-20	2	166.7-300	2	3-6	2	Hydrogen	2	5-10	2	Grey iron casting	2	1-2	2	Importe
		3	20-50	3	300-375	3	6-10	3	Nitrogen	3	10-25	3	Alloy iron casting	3	2-5		
10	Salient pole synchronous generators	4	50-100	4	375-500	4	10-15	4	Carbon-Dioxide	4	25-50	4	Malleable iron casting	4	5-10		
		5	100-150	5	500-750	5	15-20	5	Water	5	50-100	5	Spheroidal iron casting	5	10-15		
		6	150-200	6	750-1000	6	20-25	6	Oil	6	100-200	6	Carbon steel casting	6	15-25		
20	Generators driven by diesel engines	7	200-300	7	1000-1500	7	Over 25	7		7	200-300	7	Alloy steel casting	7	25-50		
		8	300-600	8	1500-3000			8		8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 600	9	Over 3000			9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
9	Others																

SITC Code 716.23 - Generating sets with internal combustion piston engines

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Power (KW)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Generating sets with internal combustion piston engine**	1.	Upto 100					1.	Mobile	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
01	With spark-ignition (explosion) engine	2.	100-250					2.	Stationary	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
02	With compression-ignition-(Diesel) engine	3.	250-500							3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	500-1000							4.	25-50	4.	Malleable iron casting	4.	5-10		
		5.	1000-2000							5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	2000-4000							6.	100-200	6.	Carbon steel casting	6.	15-25		
		7.	4000-7000							7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	7000-10.000							8.	300-500	8.	Non-ferrous casting	8.	50-100		
99	Others	9.	Over 10.000					9	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		

SITC Code 718.81 - WATER TURBINES

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (MW)	Code	Water head (m)	Code	Speed (rpm)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Pelton water turbines	1	Upto 5	1	Upto 30	1	Upto 166.7	1	Vertical	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	5-20	2	30-60	2	166.7-300	2	Horizontal	2	5-10	2	Grey iron casting	2	1-2	2	Imported
10	Francis water turbines	3	20-50	3	60-100	3	300-375			3	10-25	3	Alloy iron casting	3	2-5		
		4	50-100	4	100-150	4	375-500			4	25-50	4	Malleable iron casting	4	5-10		
20	Kaplan water turbines	5	100-150	5	150-210	5	500-750			5	50-100	5	Spheroidal iron casting	5	10-15		
		6	150-200	6	210-280	6	750-1000			6	100-200	6	Carbon steel casting	6	15-25		
99	Others	7	200-300	7	280-360	7	1000-1500			7	200-300	7	Alloy steel casting	7	25-50		
		8	300-600	8	360-450	8	1500-3000			8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 600	9	Over 450	9	Over 3000	9	Others	9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 723.41 - Construction and mining machinery - BULLDOZERS, ANGLEDOZERS AND LEVELLERS SELF-PROPELLED

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic - 1		Manufacturing characteristic - 2		Manufacturing characteristic - 3		Origin	
Code	Name	Code	Motor power (KW)	Code	Travel speed (km/h)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	Origin
00	Bulldozers	1	Upto 100	1	Upto 5			1	Rubber tires	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
10	Levellers or graders	2	100-150	2	5-10			2	Crawler	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	150-200	3	10-15					3	10-25	3	Alloy iron casting	3	2-5		
		4	200-250	4	15-20					4	25-50	4	Malleable iron casting	4	5-10		
		5	250-300	5	20-25					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	300-400	6	25-30					6	100-200	6	Carbon steel casting	6	15-25		
		7	400-500	7	Over 30					7	200-300	7	Alloy steel casting	7	25-50		
		8	Over 500							8	300-500	8	Non-ferrous casting	8	50-100		
								9	Others	9	Over 500	9	Steel fabrication	9	Over 100		

STIC Code 723.41 - Construction and mining machinery. - Bulldozers, angledozers and levellers, self-propelled.

6-7		8						11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Struck Capacity (m3)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
20	Tractor scraper	1.	Upto 10					1.	Rubber-tired	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
		2.	10-15					2.	Crawler	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
		3.	15-20							3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	20-25							4.	25-50	4.	Malleable iron casting	4.	5-10		
		5.	25-30							5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	Over 30							6.	100-200	6.	Carbon steel casting	6.	15-25		
			Tractive effort (t)							7.	200-300	7.	Alloy steel casting	7.	25-50		
30	Scraper-pusher	1.	upto 20							8.	300-500	8.	Non-ferrous casting	8.	50-100		
		2.	20-25							9.	Over 500	9.	Steel fabrication	9.	Over 100		
		3.	25-30														
		4.	30-35														
		5.	35-50														
		6.	Over 50														
99	Others							9	Others								

SITC Code 723.42 - Construction and mining machinery. - Mechanical shovels and excavators, self-propelled.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Bucket Capacity (m^3)	Code	Max.reach/ Boom length (m)	Code	Power (KW)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Front end loaders	1	1	1	Upto 3	1	Upto 100	1	Rubber-tired	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
10	Power shovels	2	1-2	2	3-6	2	100-150	2	Crawler	2	5-10	2	Grey iron casting	2	1-2	2	Imported
20	Backhoe excavators	3	2-4	3	6-8	3	150-200	3	Walking	3	10-25	3	Alloy iron casting	3	2-5		
30	Draglines	4	4-6	4	8-9	4	200-250			4	25.50	4	Malleable iron casting	4	5-10		
40	Clamshells	5	6-10	5	9-10	5	250-300			5	50-100	5	Spheroidal iron casting	5	10-15		
50	Elecetric excavators	6	10-15	6	10-11	6	300-400			6	100-200	6	Carbon steel casting	6	15-25		
60	Bucket wheel excavators	7	15-20	7	11-12	7	400-500			7	200-300	7	Alloy steel casting	7	25-50		
		8	20-30	8	12-13	8	500-600			8	300-500	8	Non-ferrous casting	8	50-100		
99	Others	9	Over 30	9	Over 13	9	Over 600	9	Others	9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 723.43 - Construction and mining machinery. - Other excavating, levelling, tamping, boring and extricating machinery for earth, minerals or ores self-propelled.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Hole Dia (mm)	Code	Length (m)	Code	Power (KW)	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
00	**Blasthole drills**	1	Upto 50	1	Upto 3	1	Upto 30	1	Rubber-tired	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Rotary	2	50-80	2	3-5	2	30-50	2	Crawler	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Percussive	3	80-100	3	5-7	3	50-70			3	10-25	3	Alloy iron casting	3	2-5		
03	Down the hole (DTH)	4	100-150	4	7-10	4	70-100			4	25-50	4	Malleable iron casting	4	5-10		
04	Jet piercing	5	150-200	5	10-15	5	100-150			5	50-100	5	Spheroidal iron casting	5	10-15		
05	Hydraulic	6	200-250	6	15-20	6	150-200			6	100-200	6	Carbon steel casting	6	15-25		
		7	250-300	7	20-25	7	200-250			7	200-300	7	Alloy steel casting	7	25-50		
		8	300-350	8	25-30	8	250-350			8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 350	9	Over 30	9	Over 350	9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
			Full-face heading capacity (m/h)		Head Die (mm)		Head power (KW)										
10	**Rod headders**	1	Upto 2	1	Upto 300	1	Upto 30	1	Single-stage								
11	Hydraulic telescopic boomed head	2	2-3	2	300-350	2	30-50	2	Multi-stage								
		3	3-5	3	350-400	3	50-100										
12	Disc head	4	5-7	4	400-500	4	100-200										
		5	Over 7	5	500-600	5	200-300										
				6	600-1000	6	300-400										
				7	1000-1500	7	Over 400										
				8	1500-2000												
				9	Over 2000			9	Others								

SITC Code 723.43 - Construction and mining machinery. - Other excavating, levelling, tamping, boring and extracting machinery for earth, minerals or ores, self-propelled.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Dia of drill (mm)	Code	Max. depth of.drilling	Code	Max.drilling angle	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
20	**Drilling machines**	1	Upto 100	1	Upto 200	1	Upto 20°	1	Rubber-tired	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	100-150	2	200-300	2	20°-30°	2	Crawler	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	150-200	3	300-400	3	Over 30°			3	10-25	3	Alloy iron casting	3	2-5		
		4	200-300	4	400-500					4	25-50	4	Malleable iron casting	4	5-10		
		5	300-500	5	500-600					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	Over 500	6	600-800					6	100-200	6	Carbon steel casting	6	15-25		
				7	800-1000					7	200-300	7	Alloy steel casting	7	25-50		
				8	1000-1200					8	300-500	8	Non-ferrous casting	8	50-100		
				9	Over 1200					9	Over 500	9	Steel fabrication	9	Over 100		
99	Others							9	Others								

SITC Code 723.46 - Construction and mining machinery. - Other excavating, levelling, tamping and excavating machinery for earth, minerals or ores, not self-propelled.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Sepc.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Bucket capacity (Litres)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Bucketline dredge	1	Upto 80							1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	80-100							2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	100-150							3	10-25	3	Alloy iron casting	3	2-5		
		4	150-200							4	25-50	4	Malleable iron casting	4	5-10		
		5	200-300							5	50-100	5	Spheroidal iron casting	5	10-15		
		6	Over 300							6	100-200	6	Carbon steel casting	6	15-25		
10	Hydraulic dredge		Dia. of outlet (mm)							7	200-300	7	Alloy steel casting	7	25-50		
		1	Upto 100							8	300-500	8	Non-ferrous casting	8	50-100		
		2	100-200							9	Over 500	9	Steel fabrication	9	Over 100		
		3	200-300														
		4	300-400														
		5	Over 400														
20	Hydraulic monitor		Nozzle dia. (mm)														
		1	Upto 5														
		2	5-8														
		3	8-10														
99	Others	4	Over 10														

STTC Code 723.51 - Mining equipment, - Blasting machines

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Ignition power (VA)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Blasting machines	1.	Upto 10							1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
		2.	10-20							2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
		3.	20-50							3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	50-100							4.	25-50	4.	Malleable iron casting	4.	5-10		
		5.	100-200							5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	200-500							6.	100-200	6.	Carbon steel casting	6.	15-25		
		7.	500-1000							7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	1000-1500							8.	300-500	8.	Non-ferrous casting	8.	50-100		
		9.	Over 1500							9.	Over 500	9.	Steel fabrication	9.	Over 100		
			Capacity of Explosives to be charged (kg)														
10	Blasthole charging equipments	1.	Upto 5														
		2.	5-10														
		3.	10-15														
		4.	Over 15														
99	Others																

SITC Code 723.52 - Mining equipment, - Mining Locomotives,

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Motor power (KW)	Code	Max.drawbar pull (KN)	Code	Max. speed (m/sec)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Locomotives**	1	Upto 20	1	Upto 9	1	Upto 3	1	Trolley	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Battery	2	20-50	2	9-12	2	3-5	2	Monorail	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Diesel	3	50-100	3	12-15	3	5-10			3	10-25	3	Alloy iron casting	3	2-5		
03	Diesel-Hydrostatic	4	100-200	4	15-20	4	10-15			4	25-50	4	Malleable iron casting	4	5-10		
04	Electrical	5	200-300	5	20-30	5	15-20			5	50-100	5	Spheroidal iron casting	5	10-15		
		6	Over 300	6	30-40	6	Over 20			6	100-200	6	Carbon steel casting	6	15-25		
				7	40-50					7	200-300	7	Alloy steel casting	7	25-50		
				8	Over 50					8	300-500	8	Non-ferrous casting	8	50-100		
99	Others							9	Others	9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 723.53 - Mining equipment, - Hydraulic props

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Supporting Capacity (t)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	.Hydraulic props	1. 2. 3. 4. 5.	Upto 20 20-30 30-40 40-50 Over 50							1. 2. 3. 4. 5. 6. 7. 8. 9.	Upto 5 5-10 10-25 25-50 50-100 100-200 200-300 300-500 Over 500	1. 2. 3. 4. 5. 6. 7. 8. 9.	Chilled iron casting Grey iron casting Alloy iron casting Malleable iron casting Spheroidal iron casting Carbon steel casting Alloy steel casting Non-ferrous casting Steel fabrication	1. 2. 3. 4. 5. 6. 7. 8. 9.	Upto 1 1-2 2-5 5-10 10-15 15-25 25-50 50-100 Over 100	1. 2.	Turkey Imported

CAPITAL GOODS DEVELOPMENT PROJECT IN TURKEY

72512 Paper or Paperboard Making Machines
from Fan Pump to Reel and Paper
Finishing Machines

Machines

6-7		8		9		10		11		12		13		14		15	
BASIC MACHINE NOMENCLATURE		Major Specification (Capacity)		Major Spec-1		Major Spec.2		Type		Manufacturing characteristic -1		Manufacturing Characteristic -2		Manufacturing Characteristic -3		Origin	
				Optional		Optional											
Code	Name	Code	Capacity (Tonnes/h)	Code	Width of material made m	Code	Design Speed m/min.	Code	Description	Code	Weight Tonnes	Code	Main Material	Code	Max Component Weight (Tonnes)	Code	
01	Paper making machine	1	up to 2	1	up to 2	1	up to 100	1	Fourdrinier single ply	1	up to 5	1	Chilled iron casting	1	up to 1	1	Turkey
02	Paperboard machine	2	2-5	2	2-3	2	100-200	2	Fourdrinier multi-ply	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	5-8	3	3-4	3	200-400	3	Vat formers	3	10-25	3	Alloy iron casting	3	2-5		
		4	8-12	4	4-5	4	400-600	4	Twin wire vertical forming zone	4	25-50	4	Malleable iron casting	4	5-10		
		5	12-18	5	5-6	5	600-800	5	Twin wire horizontal or inclined forming zone	5	50-100	5	Spheroidal iron casting	5	10-15		
		6	13-24	6	6-7	6	800-1000	6.	M.G. Cylinder	6	100-200	6	Carbon steel casting	6	15-25		
		7	24-30	7	7-8	7	1000-1200			7	200-300	7	Alloy steel casting	7	25-50		
10	Wet lap pulp machine	8	30-40	8	8-10	8	1200-1400			8	300-500	8	Non-ferrous casting	8	50-100		
11	Pulp dryer machine	9	Over 40	9	Over 10	9	Over 1400	9	Other	9	Over 500	9	Steel fabrication	9	Over 100		

72512 Paper or Paperboard Making Machines
and Paper Finishing Machines

Machines

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification		Major Spec1 Optional		Major Spec.2 Optional		Type		Manufacturing Characteristic -1		Manufacturing Characteristic -2		Manufacturing Characteristic -3		Origin	
Code	Name	Code	Capacity (t/h)	Code	Effective Width (m)	Code	Design Speed m/min	Code	Description	Code	Weight (t)	Code	Main Material	Code	Max Component Weight (t)	Code	
20	Winder	1	up to 1	1	up to 2	1	up to 100	1	Roll	1	up to 5	1	Chilled iron casting	1	up to 1	1	Turkey
		2	1-2	2	2-3	2	100-200	2	Ream	2	5-10	2	Grey iron Casting	2	1-2	2	Imported
		3	2-4	3	3-4	3	200-400			3	10-25	3	Alloy iron Casting	3	2-5		
30	Sheet Cutter	4	4-7	4	4-5	4	400-600			4	25-50	4	Malleable iron casting	4	5-10		
		5	7-10	5	5-6	5	600-800			5	50-100	5	Spheroidal iron casting	5	10-15		
		6	10-15	6	6-7	6	800-1000			6	100-200	6	Carbon steel casting	6	15-25		
40	Super Calender	7	15-20	7	7-8	7	1000-1200			7	200-300	7	Alloy steel casting	7	25-50		
		8	20-30	8	8-10	8	1200-1400			8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 30	9	Over 10	9	Over 1400			9	Over 500	9	Steel fabrication	9	Over 100		
50	Corrugator																
60	Wrapper																
61	Pallet Strapper																
62	Core cutter																
63	Core winder																
64	Gluer																
65	Baler																
70	Roll kicker																
71	Roll stop																

72513 Machinery for making Cellulosic Pulp

Fabricated equipment

6-7		8		9		10		11		12							
Basic Machine Nomenclature		Major Specification Capacity		Major Spec.1 Optional		Major Spec.2 Optional		Type		Manufacturing Characteristic -1		Manufacturing Characteristic -2		Manufacturing Characteristic -3		Origin	
Code	Name	Code	Capacity (Tonne/h)	Code	Diameter (m)	Code	Length m	Code	Description	Code	Weight (Tonne)	Code	Main Body Material	Code	Plate Thickness mm	Code	
01	Debarker	1	up to 5	1	up to 0.5	1	up to 0.5	1	Rectangular	1	up to 5	1	Mild steel up to 0.20 carbon untested quality	1	up to 20	1	Turkey
		2	5-10	2	0.5-1	2	0.5-1	2	Cylindrical	2	5-10	2	Carbon steel above 0.20C tested quality	2	20-40	2	Imported
		3	10-20	3	1-2	3	1-3	3	Conical	3	10-25	3	Boiler steel	3	40-50		
		4	20-40	4	2-3	4	3-6	4	Multi-knife	4	25-50	4	High alloy steel	4	Over 50		
		5	40-60	5	3-4	5	6-10	5	Slab	5	50-100	6	Stainless steel				
		6	60-80	6	4-5	6	10-15	6	Rechipper	6	100-200	7	Non-ferrous materials				
		7	80-100	7	5-6	7	15-20	7	Drum chipper	7	200-300						
		8	100-150	8	6-8	8	20-30			8	300-500						
02	Log splitter	9	Over 150	9	Over 8	9	Over 30	9	Other	9	Over 500						

72513 Machinery for Making Cellulosic Pulp

Tanks, chests, and other fabricated vessels with
an internal finish suitable for pulp.

Fabricated Equipment

6-7	8	9	10	11	12	13	14	15
Basic Machine Nomenclature	Major Specification	Major Spec-1 Optional	Major Spec-2 Optional	Type	Manufacturing Characteristic -1	Manufacturing Characteristic -2	Manufacturing Characteristic -3	Origin
Name	Volume (m3)	Diameter m	Temperature °C	Description	Weight (Tonne)	Main Body Material	Plate Thickness(mm)	
10 Digester	1 up to 50	1 up to 1	1 Over 500	1 Rectangular	1 up to 5	1 Mild steel upto 0.20 carbon(untested quality)	1 up to 20	1 Turkey
11 Chip Impregnator	2 50-150	2 1-2	2 500 to 1000	2 Cylindrical	2 5-10	2 Carbon steel above 0.20 C tested quality	2 20-40	2 Imported
20 Pulper	3 150-400	3 2-4	3 100 to 0	3 Spherical	3 10-25	3 Boiler steel	3 40-50	
30 Silo	4 400-1000	4 4-6	4 0 to-25	4 Conical	4 25-50	4 Alloy steel	4 Over 50	
40 Tank	5 1000-2500	5 6-8	5 -25 to -50	5 Agitated	5 50-100	5 High alloy steel		
	6 2500-4000	6 8-12	6 -50 to -100	6 Mixing Vessel	6 100-200	6 Stainless steel		
	7 4000-7000	7 12-20	7 -100 to -120	7 Vibrated	7 200-300	7 Non-ferrous materials		
	8 7000-10000	8 20-40	8 -120 to -170		8 300-500			
	9 Over 10000	9 Over 40	9 Below -170	9 Other	9 Over 500	9 Others		
50 Line slaker								
60 Stock cleaners								
70 Cyclone separator								

72514 Machinery for Making Cellulosic Pulp.

Machines

6-7	8	9	10	11	12	13	14	15
Basic Machine Nomenclature	Major Specification (Capacity)	Major Spec-1 Optional	Major Spec-2 Optional	Type	Manufacturing Characteristic -1	Manufacturing Characteristic -2	Manufacturing Characteristic -3	Origin
Name	Capacity (Tonnes/h)	Surface area (m2)	Diameter (m)	Description	Weight Tonne	Main Body Material	Plate Thickness(mm)	
01 Magnetic Separator	1 up to 1	1 up to 10	1 up to 0.5	1 Rectangular	1 up to 5	1 Chilled iron casting	1 up to 1	1 Turkey
10 Screen	2 1-2	2 10-30	2 0.5-1	2 Circular	2 5-10	2 Grey iron casting	2 1-2	2 Imported
20 Save all	3 2-4	3 30-60	3 1-1.5	3 Cylindrical	3 10-25	3 Alloy iron casting	3 2-5	
30 Washer	4 4-7	4 60-100	4 1.5-2	4 Pressure	4 25-50	4 Malleable iron casting	4 5-10	
40 Thickeners	5 7-10	5 100-150	5 2-3	5 Disc	5 50-100	5 Spheroidal iron casting	5 10-15	
	6 10-15	6 150-200	6 3-4	6 Chip	6 100-200	6 Carbon steel casting	6 15-25	
	7 15-25	7 200-300	7 4-6	7 Stock	7 200-300	7 Alloy steel casting	7 25-50	
	8 25-40	8 300-400	8 6-10	8 Chemicals	8 300-500	8 Non-ferrous casting	8 50-100	
	9 Over 40	9 Over 400	9 Over 10	9 Other	9 Over 500	9 Steel fabrication	9 Over 100	
50 Chipper								
55 Electolytic cells								

72514 Machinery for Making Cellulosic Pulp

Machines

Basic Machine Nomenclature		Major Specification (Capacity)	Major Spec-1	Major Spec-2	Type	Manufacturing Characteristic -1	Manufacturing Characteristic -2	Manufacturing Characteristic -3	Origin
			Optional	Optional					
	Name	Capacity Tonne/h	Working Surface area m^2		Description	Weight Tonnes	Main body Material	Max Component Weight (T)	
60	Refiners	1 up to 2	1 up to 0.5		1 Conical	1 up to 5	1 Chilled iron casting	1 up to 1	1 Turkey
61	Deflakers	2 2-3	2 0.5-1		2 Single disc	2 5-10	2 Grey iron casting	2 1-2	2 Imported
62	Defibrators	3 3-4	3 1-2		3 Double disc	3 10-25	3 Alloy iron casting	3 2-5	
63	Other fibre cutting machines	4 4-6	4 2-3		4 Wide angle	4 25-50	4 Malleable iron casting	4 5-10	
64	Other fibrillating machines	5 6-8	5 3-4			5 50-100	5 Spheroidal iron casting	5 10-15	
		6 8-10	6 4-6			6 100-200	6 Carbon steel casting	6 15-25	
		7 10-15	7 6-8			7 200-300	7 Alloy steel casting	7 25-50	
		8 15-25	8 8-10			8 300-500	8 Non-ferrous casting	8 50-100	
		9 Over 25	9 Over 10		9 Other	9 Over 500	9 Steel fabrication	9 Over 100	
		Input power(kw)/	Impeller speed (rpm)						
70	Mixers	1 up to 5	1 up to 100		1 Reduction gear				
71	Agitators	2 5-10	2 100-300		2 Stock				
		3 10-20	3 300-600		3 Chemicals				
		4 20-50	4 600-900		4 Top entry				
		5 50-80	5 900-1200		5 Side entry				
		6 80-150	6 1200-1500		6 Bottom entry				
		7 150 - 300	7 1500-2000						
		8 300 - 500	8 2000-3000						
		9 Over 500	9 Over 3000						

SITC Code 72521 - Paper and paperboard cutting machines of all kinds, other machinery for making up paper pulp, paper or paper board

Machines

Basic Machine Nomenclature		Major Spec.		Major Spec.1 (Optional)		Major Spec.2 (Optional)		Type		Manufacturing Charac. 1		Manufacturing Charac.2		Manufacturing Charac.3		Origin	
Code	Name	Code	Capacity (Tons/h)	Code	Width (m)	Code		Code	Descrip.	Code	Weight (Tons)	Code	Main body materials	Code	Max. component weight(Tons)	Code	
01	Cutter-Cross	1	Upto 2	1	Upto 2					1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Cutter-sheet	2	2-5	2	2-3					2	5-10	2	Grey iron casting	2	1-2	2	Imported
10	Gluer	3	5-10	3	3-4					3	10-25	3	Alloy iron casting	3	2-5		
20	Baler	4	10-15	4	4-5.5					4	25-50	4	Malleable iron casting	4	5-10		
30	Strapper	5	15-20	5	5.5-7.5					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	20-25	6	Over 7.5					6	100-200	6	Carbon steel casting	6	15-25		
		7	Over 25							7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
										9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 7272 6 - Machinery used in sugar manufacture or brewing

Page: 1

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification		Major Spec. (optional) 1		2		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity tons/day	Code	Volume Cubic meters (m^3)	Code	Area square meter (m^2)	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
01	Automatic beet unloading machine	1	Upto 125	1	Upto 5	1	Upto 10	1	Batch	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Leaf and stone catcher machine	2	125-250	2	5-10	2	10-25	2	Continuous	2	5-10	2	Grey iron casting	2	1-2	2	Imported
03	Beet washing machines	3	250-500	3	10-25	3	25-50	9	Others	3	10-25	3	Alloy iron casting	3	2-5		
04	Tail catcher machine	4	500-1000	4	25-50	4	50-100			4	25-50	4	Malleable - iron casting	4	5-10		
05	Beet cutting machine	5	1000-2000	5	50-100	5	Over 100			5	50-100	5	Spheroidal iron casting	5	10-15		
06	Sand catcher	6	2000-4000	6	100-500					6	100-200	6	Carbon steel casting	6	15-25		
07	Saturators	7	4000-6000	7	500-1000					7	200-300	7	Alloy steel casting	7	25-50		
08	Crystal sugar shaker	8	6000-8000	8	1000-1500					8	300-500	8	Non-ferrous casting	8	50-100		
09	Sugar crushers	9	Over 8000	9	Over 1500					9	Over 500	9	Steel fabrication	9	Over 100		
10	Wagon and truck unloading system by water																
49	Others																

SITC Code 7272.5 - Machinery used in sugar manufacture or brewing

Page: 2

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification Capacity		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (t/h)	Code	Volume cubic meters(m^3)	Code	Area sq. meter (m^2)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Plate thickness (mm)	Code	
50	Diffuser	1	Upto 125	1	Upto 5	1	Upto 10	1	Batch	1	Upto 5	1	Mild steel upto 0,20 C untested quality	1	Upto 20	1	Turkey
51	Liming unit	2	125-250	2	5-10	2	10-25	2	Continuous	2	5-10	2	Carbon steel above 0,20 C tested quality	2	20-40	2	Imported
99	Other	3	250-500	3	10-25	3	25-50			3	10-25	3	Boiler steel	3	40-50		
		4	500-1000	4	25-50	4	50-100			4	25-50	4	Alloy steel	4	Over 50		
		5	1000-2000	5	50-100	5	Over 100			5	50-100	5	High alloy steel				
		6	2000-4000	6	100-500					6	100-200	6	Stainless steel				
		7	4000-6000	7	500-1000					7	200-300	7	Non-ferrous materials				
		8	6000-8000	8	1000-1500					8	300-500						
		9	Over 8000	9	Over 1500			9	Others	9	Over 500	9	Others				

SITC Code 72831 - Machinery for sorting, screening, separating or washing earth, stones, ores or other mineral substances in solid, powder or paste form,

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic - 1		Manufacturing characteristic - 2		Manufacturing characteristic - 3		Origin	
Code	Name	Code	Capacity (t/h)	Code	Sieve opening (mm)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Screens**	1	Upto 20	1	Upto 0.3			1	Open type	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Grizzly screens	2	20-50	2	0.3-0.7			2	Pressure type	2	5-10			2	1-2	2	Imported
02	Oscillating screens	3	50-100	3	0.7-1.5					3	10-25	2	Grey iron casting	3	2-5		
03	Reciprocating screens	4	100-250	4	1.5-4.0			9	Others	4	25-50			4	5-10		
04	Gyratory screens	5	250-500	5	4.0-8.0					5	50-100	3	Alloy iron casting	5	10-15		
05	Rotary disc screens	6	500-1000	6	8.0-16.0					6	100-200			6	15-25		
06	Vibrating screens	7	1000-1500	7	16.0-32.0					7	200-300	4	Malleable iron casting	7	25-50		
07	Cylindrical screens	8	Over 1500	8	32.0-64.0					8	300-500			8	50-100		
				9	Over 64.0					9	Over 500	5	Spheroidal iron casting	9	Over 100		
10	**Wet classifiers**																
11	Cone wet classifiers											6	Carbon steel casting				
12	Cyclone wet classifiers																
13	Drag wet classifiers											7	Alloy steel casting				
14	Rake wet classifiers																
15	Spiral wet classifiers											8	Non-ferrous casting				
16	Bowl wet classifiers																
17	Bowl-desilter wet classifiers											9	Steel fabrication				
18	Counter-current wet classifiers																
20	**Separators**																
21	Hydro-separator																
22	Sand washer																

SITC Code 72831 - Machinery for sorting, screening, separating or washing
earth, stones, ores or other mineral substances in solid, powder or paste form,

PAGE: 2

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity (t/h)	Code	Sieve opening (mm)	Code		Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
23	Hydraulic sizer	1.	Upto 20	1.	Upto 0.3					1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
24	Siphon sizer	2.	20-50	2.	0.3-0.7					2.	5-10			2.	1-2	2.	Imported
25	Super sorter	3.	50-100	3.	0.7-1.5					3.	10-25	2.	Grey iron casting	3.	2-5		
26	Hydroscillator	4.	100-250	4.	1.5-4.0					4.	25-50			4.	5-10		
27	Jigging separator	5.	250-500	5.	4.0-8.0					5.	50-100	3.	Alloy iron casting	5.	10-15		
28	Concentrating tables	6.	500-1000	6.	8.0-16.0					6.	100-200			6.	15-25		
29	Spiral separator	7.	1000-1500	7.	16.0-32.0					7.	200-300	4.	Malleable iron casting	7.	25-50		
30	Magnetic separator	8.	Over 1500	8.	32.0-64.0					8.	300-500			8.	50-100		
31	Stationary magnet			9.	Over 64.0			1.	Dry drum	9.	Over 500	5.	Spheroidal iron casting	9.	Over 100		
								2.	Wet drum								
								3.	Belt			6.	Carbon steel casting				
32	Electro-static magnet separator							9	Others								
								1.	Low-intensity			7.	Alloy steel casting				
								2.	High-intensity								
								3.	Wet high-intensity			8.	Non-ferrous casting				
40	Dense-media separatory vessels																
								9	Others			9.	Steel fabrication				
41	Revolving drum																
42	Drag-tank																
43	Cyclone																
50	Dry sorting machines																
51	Optical sorting machine																
52	Pusher type																

ANNEXTURE: Sieve series and Tyler equivalents.

SITC Code 72831 - Machinery for sorting, screening, separating or washing earth, stones, ores or other mineral substances in solid, powder or paste form, PAGE: 3

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity	Code	Sieve opening (mm)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
60	Pneumatic seperator	1.	Upto 20	1.	Upto 0.3			1.	Open type	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
		2.	20-50	2.	0.3-0.7			2.	Pressure type	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
70	Flotation machinery	3.	50-100	3.	0.7-1.5					3.	10-25	3.	Alloy iron casting	3.	2-5		
71	Pneumatic machines	4.	100-250	4.	1.5-4.0					4.	25-50	4.	Malleable iron casting	4.	5-10		
72	Mechanical machines	5.	250-500	5.	4.0-8.0					5.	50-100	5.	Spheroidal iron casting	5.	10-15		
73	Combined machines	6.	500-1000	6.	8.0-16.0					6.	100-200	6.	Carbon steel casting	6.	15-25		
		7.	1000-1500	7.	16.0-32.0					7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	Over 1500	8.	32.0-64.0			9	Others	8.	300-500	8.	Non-ferrous casting	8.	50-100		
99	Others			9.	Over 64.0					9.	Over 500	9.	Steel fabrication	9.	Over 100		

Table 21-16. U.S. Sieve Series and Tyler Equivalents

A.S.T.M.--E-11-61

Sieve designation		Sieve opening		Nominal wire diam.		Tyler equivalent designation
Standard	Alternate	mm.	in. (approx. equivalents)	mm.	in. (approx. equivalents)	
107.6 mm.	4.24 in.	107.6	4.24	6.40	0.2520	
101.6 mm.	4 in+	101.6	4.00	6.30	.2480	
90.5 mm.	3½ in.	90.5	3.50	6.08	.2394	
76.1 mm.	3 in.	76.1	3.00	5.80	.2283	
64.0 mm.	2½ in.	64.0	2.50	5.50	.2165	
53.8 mm.	2.12 in.	53.8	2.12	5.15	.2028	
50.8 mm.	2 in+	50.8	2.00	5.05	.1988	
45.3 mm.	1³/₄ in.	45.3	1.75	4.85	.1909	
38.1 mm.	1½ in.	38.1	1.50	4.59	.1807	
32.0 mm.	1¼ in.	32.0	1.25	4.23	.1665	
26.9 mm.	1.06 in.	26.9	1.06	3.90	.1535	1.050 in.
25.4 mm.	1 in+	25.4	1.00	3.80	.1496	
22.6 mm.*	7/8 in.	22.6	0.875	3.50	.1378	0.883 in.
19.0 mm.	3/4 in.	19.0	.750	3.30	.1299	.742 in.
16.0 mm.*	5/8 in.	16.0	.625	3.00	.1181	.624 in.
13.5 mm.	0.530 in.	13.5	.530	2.75	.1083	.525 in.
12.7 mm.	½ in+	12.7	.500	2.67	.1051	
11.2 mm.*	7/16in.	11.2	.438	2.45	.0965	.441 in.
9.51mm.	3/8 in.	9.51	.375	2.27	.0894	.371 in.
8.00mm.*	5/16in.	8.00	.312	2.07	.0815	2½ mesh
6.73mm.	0.265 in.	6.73	.265	1.87	.0736	3 mesh
6.35mm.	¼ in.+	6.35	.250	1.82	.0717	
5.66mm.*	No. 3½	5.66	.223	1.68	.0661	3½ mesh
4.76mm.	No. 4	4.76	.187	1.54	.0606	4 mesh
4.00mm.*	No. 5	4.00	.157	1.37	.0539	5 mesh
3.36mm.	No. 6	3.36	.132	1.23	.0484	6 mesh
2.83mm.*	No. 7	2.83	.111	1.10	.0430	7 mesh
2.38mm.	No. 8	2.38	.0937	1.00	.0394	8 mesh
2.00mm.*	No. 10	2.00	.0787	0.900	.0354	9 mesh
1.68mm.	No. 12	1.68	.0661	.810	.0319	10 mesh
1.41mm.*	No. 14	1.41	.0555	.725	.0285	12 mesh
1.19mm.	No. 16	1.19	.0469	.650	.0256	14 mesh
1.00mm.*	No. 18	1.00	.0394	.580	.0228	16 mesh
841 micron	No. 20	0.841	.0331	.510	.0201	20 mesh
707 micron*	No. 25	.707	.0278	.450	.0177	24 mesh
595 micron	No. 30	.595	.0234	.390	.0154	28 mesh
500 micron*	No. 35	.500	.0197	.340	.0134	32 mesh
420 micron	No. 40	.420	.0165	.290	.0114	35 mesh
354 micron*	No. 45	.354	.0139	.247	.0097	42 mesh
297 micron	No. 50	.297	.0117	.215	.0085	48 mesh
250 micron*	No. 60	.250	.0098	.180	.0071	60 mesh
210 micron	No. 70	.210	.0083	.152	.0060	65 mesh
177 micron*	No. 80	.177	.0070	.131	.0052	80 mesh
149 micron	No. 100	.149	.0059	.110	.0043	100 mesh
125 micron*	No. 120	.125	.0049	.091	.0036	115 mesh
105 micron	No. 140	.105	.0041	.076	.0030	150 mesh
88 micron*	No. 170	.088	.0035	.064	.0025	170 mesh
74 micron	No. 200	.074	.0029	.053	.0021	200 mesh
63 micron*	No. 230	.063	.0025	.044	.0017	250 mesh
53 micron	No. 270	.053	.0021	.037	.0015	270 mesh
44 micron*	No. 325	.044	.0017	.030	.0012	325 mesh
37 micron	No. 400	.037	.0015	.025	.0010	400 mesh

Table 21-16. U.S. Sieve Series and Tyler Equivalents

A.S.T.M.--E-11-61

These sieves correspond to those proposed as an international (I.S.O.) standard. It is recommended that wherever possible these sieves be included in all sieve analysis data or reports intended for international publication

These sieves are not in the fourth-root-of-2 series, but they have been included because they are in common usage.

STTC Code 72832 - Machinery for crushing or grinding earth, stones, ores or other mineral substances in solid, powder and paste form.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Tons per hour (t/h)	Code	Revolution per minute (r.p.m.)	Code	Power required (k.)	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Max. Component Weight(tons)	Code	
00	Crushers	1.	Upto 100	1.	Upto 20	1.	Upto 50	1.	Horizontal	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
01	Gyratory or cone crusher	2.	100-200	2.	20-50	2.	50-100	2.	Vertical	2.	5-10			2.	1-2	2.	Importe
02	Jaw crusher	3.	200-300	3.	50-100	3.	100-200			3.	10-25	2.	Grey iron casting	3.	2-5		
03	Impactor crusher	4.	300-400	4.	100-500	4.	200-300	9	Others	4.	25-50			4.	5-10		
04	Hammer crusher	5.	400-500	5.	500-600	5.	300-500			5.	50-100	3.	Alloy iron casting	5.	10-15		
05	Toothed roll crusher	6.	500-750	6.	600-1000	6.	500-1000			6.	100-200			6.	15-25		
06	Dry pan crusher	7.	750-1000	7.	1000-1500	7.	1000-3000			7.	200-300	4.	Malleable iron casting	7.	25-50		
07	Roll/drum crusher	8.	1000-1500	8.	1500-2000	8.	3000-5000			8.	300-500			8.	50-100		
		9.	Over 1500	9.	Over 2000	9.	Over 5000			9.	Over 500	5.	Spheroidal iron casting	9.	Over 100		
10	Grinding mills							1.	Under pressure								
11	Ball mills							2.	Under suction			6.	Carbon steel casting				
12	Hammer mills																
13	Roll grinding mills											7.	Alloy steel casting				
14	Homogenising mills							9	Others								
15	Rod mills											8.	Non-ferrous casting				
16	Cone mills																
17	Pebble mills											9.	Steel fabrication				
18	Beater wheel mills																
19	Impact mills																

SITC Code728.33 - Machinery for mixing or kneading earth, stone, ores or other mineral substances in solid (including powder and paste) form.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity (m^3)	Code	Motor Power (KW)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Mixers	1.	Upto 2	1.	Upto 5			1.	Repulser	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
		2.	2-5	2.	5-10			2.	Conditioner	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
		3.	5-7	3.	10-15					3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	7-10	4.	15-20					4.	25-50	4.	Malleable iron casting	4.	5-10		
		5.	10-15	5.	20-25					5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	15-20	6.	25-30					6.	100-200	6.	Carbon steel casting	6.	15-25		
		7.	Over 20	7.	Over 30					7.	200-300	7.	Alloy steel casting	7.	25-50		
										8.	300-500	8.	Non-ferrous casting	8.	50-100		
99	Others							9	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		

SITC Code 728.34 - Machinery for agglomerating, moulding or shaping solid mineral fuels, ceramic paste, unhardened cements, plastering materials or other mineral products in powder or paste form, and machines for forming foundry moulds of sand.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity (t/h)	Code	Drum dia (m)	Code		Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
01	Agglomeraters	1	Upto 100	1	Upto 2.0			1	Pallet drum	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Granulators	2	100-120	2	2.0-2.5			2	Press drum	2	5-10	2	Grey iron casting	2	1-2	2	Imported
03	Pelletisers	3	120-150	3	2.5-3.0					3	10-25	3	Alloy iron casting	3	2-5		
04	Palletisers	4	150-200	4	3.0-3.5					4	25-50	4	Malleable iron casting	4	5-10		
05	Prilling Tower	5	Over 200	5	3.5-4.0					5	50-100	5	Spheroidal iron casting	5	10-15		
				6	Over 4.0					6	100-200	6	Carbon steel casting	6	15-25		
										7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
										9	Over 500	9	Steel fabrication	9	Over 100		
99	Others							9	Others								

SITC Code 736.12 - Metal cutting machine-tools. Gear-cutting machines

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max.outside diameter (mm)	Code		Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Gear milling machines	1	Upto 150			1	With numerical control	1	External	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Gear milling machines (worms, worm gear)	2	150-200			2	Without numerical control	2	Internal	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Gear milling machines (Spur, helical, worms)	3	200-300					9	Others	3	10-25	3	Alloy iron casting	3	2-5		
03	Gear milling machines (bevel)	4	300-500							4	25-50	4	Malleable iron casting	4	5-10		
04	Gear milling machines (others)	5	500-700							5	50-100	5	Spheroidal iron casting	5	10-15		
10	Gear hobbing machines	6	Above 700							6	100-200	6	Carbon steel casting	6	15-25		
11	Gear hobbing machines (worms, worm gear)									7	200-300	7	Alloy steel casting	7	25-50		
12	Gear hobbing machines (spur, helical,worms)									8	300-500	8	Non-ferrous casting	8	50-100		
13	Gear hobbing machines (bevel)									9	Over 500	9	Steel fabrication	9	Over 100		
14	Gear hobbing machines (others)																
20	Gear shaping machines							1	External-pull								
21	Gear shaping machines (spur, helical)							2	External-push								
22	Gear shaping machines (herringbone)							3	Internal-pull								
23	Gear shaping machines (others)							4	Internal-push								
30	Gear broaching machines							9	Others								
31	Gear broaching machines (spur, helical)																
32	Gear broaching machines (others)																

SITC Code 736.12 - Metal cutting machine-tools.
Gear-cutting machines

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max.outside diameter (mm)	Code		Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
33	Gear shearing machines (spur)	1 2	Upto 150 150-200			1	With numerical control	1 2	External Internal	1 2	Upto 5 5-10	1	Chilled iron casting	1 2	Upto 1 1-2	1 2	Turkey Imported
34	Gear shearing machines (others)	3 4	200-300 300-500			2	Without numerical control	9	Others	3 4	10-25 25-50	2	Grey iron casting	3 4	2-5 5-10		
40	Gear shaving machines	5	500-700							5	50-100	3	Alloy iron casting	5	10-15		
41	Gear shaving machines (spur, helical)	6	Above 700					1 2	External-Rotary External-Rack	6 7	100-200 200-300	4	Malleable iron casting	6 7	15-25 25-50		
42	Gear shaving machines (herringbone)							3 4	Internal-Rotary Internal-Rack	8 9	300-500 Over 500	5	Spheroidal iron casting	8 9	50-100 Over 100		
43	Gear shaving machines (others)							9	Others								
50	Gear honing machines											6	Carbon steel casting				
51	Gear honing machines (spur, helical)							1 2	External Internal			7	Alloy steel casting				
52	Gear honing machines (others)							9	Others			8	Non-ferrous casting				
60	Gear lapping machines																
61	Gear lapping machines (spur, helical)							1 2	External Internal			9	Steel fabrication				
62	Gear lapping machines (bevel, spiral bevel)							9	Others								
63	Gear lapping machines (hypoid)																
70	Gear grinding machines																
71	Gear grinding machines (spur, helical)							1 2	External Internal								
72	Gear grinding machines (worms)							9	Others								
73	Gear grinding machines (bevel)																
99	Others																

SITC Code 736.13 - Metal cutting machine-tools.
Lathes, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Swing over bed or turning dia. (mm)	Code	Max. working length (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
01	Tool room lathes	1	Upto 100	1	Upto 300	1	With numerical control			1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Chucking lathes	2	100-300	2	300-1000	2	Without numerical control			2	5-10	2	Grey iron casting	2	1-2	2	Imported
03	Centre lathes	3	300-500	3	1000-3000					3	10-25	3	Alloy iron casting	3	2-5		
04	Facing lathes	4	500-700	4	3000-8000					4	25-50	4	Malleable iron casting	4	5-10		
05	Horizontal turret lathes	5	700-1000	5	8000-12.000			1 2	Single-station Multi-station	5	50-100	5	Spheroidal iron casting	5	10-15		
06	Vertical turning and boring mills	6	1000-1500	6	Above 12.000			1 2	Single-column Double-column	6	100-200	6	Carbon steel casting	6	15-25		
07	Horizontal automatic lathes	7	1500-2500					1 2	Single-spindle Multi-spindle	7	200-300	7	Alloy steel casting	7	25-50		
08	Vertical automatic lathes	8	Above 2500							8	300-500	8	Non-ferrous casting	8	50-100		
09	Automatic screw cutting lathes							1 2	Single-spindle Multi-spindle	9	Over 500	9	Steel fabrication	9	Over 100		
10	Special purpose lathes/ crank-shaft, duplicating, roll turning, and other special lathes																
99	Others							9	Others								

SITC Code 736.14 - Metal cutting machine-tools.
Reaming and milling machines, metalworking.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Longitudinal travel (mm)	Code	Max.working width(transverse) (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Knee-type milling machines**	1	Upto 250	1	Upto 250	1	With numerical control	1	Horizontal	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Hand feed millers	2	250-700	2	250-500	2	Without numerical control	2	Vertical	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Plain milling machines	3	700-1000	3	500-700			9	Others	3	10-25	3	Alloy iron casting	3	2-5		
03	Universal milling machines	4	1000-1500	4	700-1000					4	25-50	4	Malleable iron casting	4	5-10		
04	Ram type universal milling machines	5	1500-5000	5	1000-1500					5	50-100	5	Spheroidal iron casting	5	10-15		
05	Rotary head milling machines	6	Above 5000	6	Above 1500					6	100-200	6	Carbon steel casting	6	15-25		
0	**Bed-type milling machines**									7	200-300	7	Alloy steel casting	7	25-50		
11	Simplex (1 spindle)							1	Horizontal	8	300-500	8	Non-ferrous casting	8	50-100		
12	Duplex (2 spindles)							2	Vertical	9	Over 500	9	Steel fabrication	9	Over 100		
13	Triplex (3 spindles)							9	Others								
14	Multi spindle milling machines																
20	**Plano-milling machines**																
21	Open-side milling machines																
22	Double-column milling machines																
30	**Special milling machines**																
31	Rotary table milling machines																
32	Profiling machines																
33	Duplicating machines																
34	Pantograph milling machines																
35	Machining centers																
36	Thread milling machines																
37	Other special milling machines																
99	Others																

STTC Code 736.15 - Metal cutting machine-tools.
Drilling and boring machines, metalworking.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origir	
Code	Name	Code	Max. drilling dia (mm)	Code	Max. drilling depth (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Drilling machines**	1	Upto 10	1	Upto 100	1	With numerical			1	Upto 5	1	Chilled iron	1	Upto 1	1	Turkey
		2	10-25	2	100-200		control			2	5-10		casting	2	1-2	2	Import
01	Portable drills	3	25-35	3	200-400	2	Without			3	10-25	2	Grey iron	3	2-5		
02	Up-right drilling machines	4	35-50	4	400-500		numerical			4	25-50		casting	4	5-10		
03	Radial drilling machines	5	50-80	5	Above 500		control			5	50-100	3	Alloy iron	5	10-15		
04	Turret drilling machines	6	Above 80							6	100-200		casting	6	15-25		
05	Multi-spindle drilling machines					9	Others			7	200-300	4	Malleable	7	25-50		
06	Automatic production drilling									8	300-500		iron casting	8	50-100		
	mach[illegible]									9	Over 500	5	Spheroidal	9	Over 100		
07	Deep-hole drilling machines												iron casting				
08	Horizontal drilling machines				Max. workable							6	Carbon steel				
			Spindle dia		hight x width								casting				
.0	**Boring machines**		(mm)		(mm)							7	Alloy steel				
													casting				
.1	Precision boring machines	1	Upto 10	1	Upto 500 x 500	1	With numerical	1	Table type			8	Non-ferrous				
.2	Horizontal boring machines	2	10-50	2	500-1000 x 500		control	2	Floor type				casting				
.3	Vertical jig borers	3	50-100		-1000	2	Without					9	Steel				
.4	Special boring machines	4	100-150	3	1000-1500 x		numerical						fabrication				
.5	Machining centers	5	150-200		1000-1500		control	9	Others								
		6	Above 200	4	1500-2000 x												
					1500-2000	9	Others										
				5	2000-2500 x												
					2000-2500												
				6	Above 2500 x												
9	Others				2500												

SITC Code 736.16 - Metal cutting machine-tools.
Sawing (including friction or abresive cutting off)
machines, metalworking.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Cutting diameter (mm)	Code		Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Reciprocating sawing mach.																
01	Reciprocating sawing machine (with arm saw blade)	1 2 3 4	Upto 150 150-250 250-350 Above 350			1 2	With numerical control Without numerical control			1 2 3 4 5 6 7 8 9	Upto 5 5-10 10-25 25-50 50-100 100-200 200-300 300-500 Over 500	1 2 3 4 5 6 7 8 9	Chilled iron casting Grey iron casting Alloy iron casting Malleable iron casting Spheroidal iron casting Carbon steel casting Alloy steel casting Non-ferrous casting Steel fabrication	1 2 3 4 5 6 7 8 9	Upto 1 1-2 2-5 5-10 10-15 15-25 25-50 50-100 Over 100	1 2	Turkey Importe
10	Circular sawing machines				Saw diameter (mm)												
11	Circular sawing machines with circular blade			1 2 3 4	Upto 500 500-800 800-1500 Above 1500												
12	Circular sawing machines with steel friction disc																
13	Circular sawing machines with abresive disc																
14	Circular sawing machines, others																
20	Band sawing machines																
21	Band saws with sawing blade							1 2 9	Horizontal Vertical Others								
22	Band saws with friction blade																
23	Band saws, others																
30	Contour sawing and filing machines																
99	Sawing machines, others																

SITC Code 736.17 - Metal cutting machine-tools, Planing machines, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Maximum workable length (mm)	Code	Maximum workable width (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Planers**	1	Upto 2000	1	Upto 1500	1	With numerical control			1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Double column planers	2	2000-4000	2	1500-1750	2	Without numerical control			2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Open-side planers	3	4000-6000	3	1750-2000					3	10-25	3	Alloy iron casting	3	2-5		
03	Pit-type planers	4	6000-8000	4	2000-2250					4	25-50	4	Malleable iron casting	4	5-10		
04	Edge or plate planers	5	8000-10000	5	2250-2500					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	10000-12000	6	2500-2750					6	100-200	6	Carbon steel casting	6	15-25		
		7	Above 12000	7	Above 2750					7	200-300	7	Alloy steel casting	7	25-50		
10	**Shapers**	1	Upto 150	1	Upto 500					8	300-500	8	Non-ferrous casting	8	50-100		
11	Horizontal-push cut shapers	2	150-300	2	500-600					9	Over 500	9	Steel fabrication	9	Over 100		
12	Horizontal-drow cut shapers	3	300-450	3	600-700												
13	Special purpose shapers	4	450-600	4	700-800												
		5	600-750	5	800-900												
		6	750-1000	6	900-1000												
20	**Slotters**	7	Above 1000	7	Above 1000												
21	Key slotters																
			Broaching force (tons)		Broaching length (mm)												
30	**Broaching machines**	1	Upto 2	1	Upto 900			1	External								
31	Pull broaching machines (Vertical-mechanical)	2	2-10	2	900-1000			2	Internal								
32	Pull broaching machines (Vertical-hydraulic)	3	10-20	3	1000-1200			3	External-Internal								
		4	20-40	4	1200-1600												
		5	40-50	5	1600-2000												
		6	Above 50	6	Above 2000			9	Others								

SITC Code 736.17 - Metal cutting machine-tools. Planning machines, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Broaching force (tons)	Code	Broaching length (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
33	Pull broaching machines (Horizontal-mechanical)	1	Upto 2	1	Upto 900	1	With numerical control	1	External	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
34	Pull broaching machines (Horizontal-hydraulic)	2	2-10	2	900-1000	2	Without numerical control	2	Internal	2	5-10	2	Grey iron casting	2	1-2	2	Imported
35	Push broaching machines (Mechanical)	3	10-20	3	1000-1200			3	External-Internal	3	10-25	3	Alloy iron casting	3	2-5		
36	Push broaching machines (Hydraulic)	4	20-40	4	1200-1600					4	25-50	4	Malleable iron casting	4	5-10		
37	Continuous broaching machines (Surface broach-mechanical)	5	40-50	5	1600-2000					5	50-100	5	Spheroidal iron casting	5	10-15		
38	Continuous broaching machines (Surface broach-hydraulic)	6	Above 50	6	Above 2000					6	100-200	6	Carbon steel casting	6	15-25		
39	Rotary broaching machines									7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
99	Others							9	Others	9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 736.18 - Metal cutting machine-tools.
Tapping or screw-cutting machines.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max.working diameter (mm)	Code	Max.workable length (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
01	High speed threading machines (single tip-tool)	1	Upto 10	1	Upto 250	1	With numerical control			1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Automatic die head (turret lathes)	2	10-30	2	250-500	2	Without numerical control			2	5-10	2	Grey iron casting	2	1-2	2	Imported
03	Thread milling machines	3	30-60	3	500-1000					3	10-25	3	Alloy iron casting	3	2-5		
04	Thread chasing machines	4	60-100	4	1000-1500					4	25-50	4	Malleable iron casting	4	5-10		
05	Flat die thread rolling machines	5	100-150	5	1500-2000					5	50-100	5	Spheroidal iron casting	5	10-15		
06	Round die thread rolling machines	6	150-250	6	2000-3000					6	100-200	6	Carbon steel casting	6	15-25		
07	Tapping machines	7	Above 250	7	Above 3000					7	200-300	7	Alloy steel casting	7	25-50		
08	Thread grinders									8	300-500	8	Non-ferrous casting	8	50-100		
99	Others									9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 736.19 - Metal cutting machine-tools
Sharpening, trimming, trueing, grinding, polishing, lapping, dressing or surfacing machines and similar machines for working metal or metal carbides, operating by means of grinding wheels, abrasives or polishing products.

Page: 1

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max. workable diameter (mm)	Code	Max. workable length (mm)	Code	Control system	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
00	**External cylindrical grinders**	1.	Upto 100	1.	Upto 500	1	With numerical control			1.	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	External cylindrical grinders (plain)	2.	100-150	2.	500-1000	2	Without numerical control			2.	5-10	2.	Grey iron casting	2	1-2	2.	Imported
02	External cylindrical grinders (Universal)	3.	150-250	3.	1000-1500					3.	10-25	3.	Alloy iron casting	3	2-5		
03	External cylindrical grinders (roll and center-less)	4.	250-350	4.	1500-2500					4.	25-50	4.	Malleable iron casting	4	5-10		
04	External cylindrical grinders (Others)	5.	350-450	5.	2500-3000					5.	50-100	5.	Spheroidal iron casting	5	10-15		
10	**Internal cylindrical grinders**	6.	450-600	6.	3000-4000					6.	100-200	6.	Carbon steel casting	6	15-25		
11	Internal cylindrical grinders (plain)	7.	Above 600	7.	Above 4000					7.	200-300	7.	Alloy steel casting	7	25-50		
12	Internal cylindrical grinders (centerless)									8.	300-500	8.	Non-ferrous casting	8	50-100		
13	Internal cylindrical grinders (others)									9.	Over 500	9.	Steel fabrication	9	Over 100		

SITC Code 736.19 - Metal cutting machine-tools
Sharpening, trimming, trueing, grinding, polishing, lapping, dressing or surfacing machines and similar machines for working metal or metal carbides, operating by means of grinding wheels, abrasives or polishing products.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max.workable width (mm)	Code	Max. workable length(mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
20	Surface grinders	1	Upto 150	1	Upto 500	1	With numerical control	1	Horizontal spindle	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
21	Surface grinders (reciprocating table)	2	150-250	2	500-1000	2	Without numerical control	2	Vertical spindle	2	5-10	2	Grey iron casting	2	1-2	2	Imported
22	Surface grinders (rotary table)	3	250-500	3	1000-1500			9	Others	3	10-25	3	Alloy iron casting	3	2-5		
23	Surface grinders (others)	4	500-750	4	1500-2500					4	25-50	4	Malleable iron casting	4	5-10		
30	Tool and cutter grinders	5	750-1000	5	2500-3000					5	50-100	5	Spheroidal iron casting	5	10-15		
31	Tool and cutter grinding machines (universal)	6	1000-1500	6	3000-4000					6	100-200	6	Carbon steel casting	6	15-25		
32	Tool and cutter grinding machines (special purpose--drill, tool bit)	7	Above 1500	7	Above 4000					7	200-300	7	Alloy steel casting	7	25-50		
33	Tool and cutter grinding machines (jig grinding machines)		Max.workable diameter (mm)							8	300-500	8	Non-ferrous casting	8	50-100		
		1	Upto 100							9	Over 500	9	Steel fabrication	9	Over 100		
		2	100-150														
		3	150-250														
		4	250-350														
		5	350-450														
		6	450-600														
		7	Above 600														

SITC Code 736.19 - Metal cutting machine-tools

Sharpening,trimming,trucing,grinding,polishing,lapping,dressing or surfacing machines and similar machines for working metal or metal carbides operating by means of grinding wheels,abrasives or polishing products.

Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.1 Optional		Major Spec.2 Optional		Type		Manufacturing Characteristic 1		Manufacturing Characteristic 2		Manufacturing Characteristic 3		Origin	
Code	Name	Code	Max. workable width (mm)	Code	Max. workable length (mm)	Code	Control system	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. component weight(tons)	Code	
40	Special grinders																
41.	Special purpose grinding machines/ slide-way, cam,piston crenk-shaft	1. 2. 3. 4. 5. 6. 7.	Upto 100 100-150 150-250 250-350 350-450 450-600 Above 600	1. 2. 3. 4. 5. 6. 7.	Upto 500 500-1000 1000-1500 1500-2500 2500-3000 3000-4000 Above 4000	1. 2.	With numerical control Without numerical control		–	1. 2. 3. 4. 5. 6. 7. 8. 9.	Upto 5 5-10 10-25 25-50 50-100 100-200 200-300 300-500 Over 500	1. 2. 3. 4. 5. 6. 7. 8. 9.	Chilled iron casting Grey iron casting Alloy iron casting Malleable iron casting Spheroidal iron casting Carbon steel casting Alloy steel casting Non-ferrous casting Steel fabrication	1. 2. 3. 4. 5. 6. 7. 8. 9.	Upto 1 1-2 2-5 5-10 10-15 15-25 25-50 50-100 Over 100	1. 2.	Turkey Imported
42	Disk,surface finishing machines machines																
43	Flexible band, surface finishing																
44	Two-wheel polishing or buffing machines																

SITC Code 736.19 - Metal cutting machine-tools
Sharpening, trimming, trueing, grinding, polishing, lapping, dressing or surfacing machines and similar machines for working metal or metal carbides, operating by means of grinding wheels, abrasives or polishing products.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max. workable diameter(mm)	Code	Max. workable length(mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
45	Honing machines	1	Upto 100	1	Upto 500	1	With numerical control		—	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
46	Lapping machines	2	100-150	2	500-1000	2	Without numerical control			2	5-10	2	Grey iron casting	2	1-2	2	Imported
47	Sharpening machines	3	150-250	3	1000-1500					3	10-25	3	Alloy iron casting	3	2-5		
48	Superfinishing and other abrasing machines	4	250-350	4	1500-2500					4	25-50	4	Malleable iron casting	4	5-10		
		5	350-450	5	2500-3000					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	450-600	6	3000-4000					6	100-200	6	Carbon steel casting	6	15-25		
		7	Above 600	7	Above 4000					7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
										9	Over 500	9	Steel fabrication	9	Over 100		
99	Others																

SITC Code 736.21 - Metal forming machine-tools.
Forging machines and stamping machines, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Force (tons)	Code		Code	Control system	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
00	Hammers																
01	Drop hammers	1	Upto 10			1	With numerical control		–	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Steam and compressed air hammer	2	10-20			2	Without numerical control			2	5-10	2	Grey iron casting	2	1-2	2	Imported
03	Spring hammers	3	20-40							3	10-25	3	Alloy iron casting	3	2-5		
04	Electromagnetic hammers	4	40-75							4	25-50	4	Malleable iron casting	4	5-10		
		5	75-150							5	50-100	5	Spheroidal iron casting	5	10-15		
10	Forging machines	6	150-300					1	Mechanical	6	100-200	6	Carbon steel casting	6	15-25		
11	Forging presses	7	300-1000					2	Hydraulic	7	200-300	7	Alloy steel casting	7	25-50		
12	Swaging machines	8	1000-5000							8	300-500	8	Non-ferrous casting	8	50-100		
13	Forging rolls	9	Above 5000					9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
20	Stamping presses																

SITC Code 736.22 - Metal forming machine-tools,
Bending, forming, folding or flattening
machines, metalworking

Machines
Page 1

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec. -1 Optional		Major Spec. -2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Force (tons)	Code		Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max Component Weight (tons)	Code	
00	Bench press	1.	Upto 10			1.	With numerical control	1.	Single columb (mechanical)	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
01	Bench press (forming,bending folding)	2.	10-20			2.	Without numerical control	2.	Single column (hydraulic)	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
02	Bench press (drawing)	3.	20-40					3.	Double column (mechanical)	3.	10-25	3.	Alloy iron casting	3.	2-5		
03	Bench press (others)	4.	40-75					4.	Double column (hydraulic)	4.	25-50	4.	Malleable iron casting	4.	5-10		
10	Inclinable-open back	5.	75-150					5.	Multi column (mechanical)	5.	50-100	5.	Spheroidal iron casting	5.	10-15		
11	Inclinable press open back (forming,bending folding)	6.	150-500					6.	Multi column (hydraulic)	6.	100-200	6.	Carbon steel casting	6.	15-25		
12	Inclinable press-open back	7.	500-1000					7.	Horizontal (mechanical)	7.	200-300	7.	Alloy steel casting	7.	25-50		
13	Inclinable press-open back (extruding, coining, flattening)	8.	1000-5000					8.	Horizontal (hydraulic)	8.	300-500	8.	Non-ferrous casting	8.	50-100		
		9.	Above 5000					9.	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		

SITC Code 736.22 - Metal forming machine-tools,
Bending, forming, folding or flattening
machines, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Force (tons)	Code		Code	Control system	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
20	Non-inclinable presses					1	With numerical control	1.	Single column (mechanical)	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
21	Non-inclinable press (forming,bending, folding)	1	Upto 10			2	Without numerical control	2.	Single column (hydraulic)	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
22	Non-inclinable press (drawing)	2	10-20					3.	Double column (mechanical)	3.	10-25	3.	Alloy iron casting	3.	2-5		
23	Non-inclinable press (extruding, coining,flattening)	3	20-40					4.	Double column (hydraulic)	4.	25-50	4.	Malleable iron casting	4.	5-10		
30	End-wheel presses	4	40-75					5.	Multi column (mechanical)	5.	50-100	5.	Spheroidal iron casting	5.	10-15		
31	End-wheel press closed back (deepthroat press) (forming, folding)	5	75-150					6.	Multi column (hydraulic)	6.	100-200	6.	Carbon steel casting	6.	15-25		
32	End-wheel press, closed back (deepthroat press)	6	150-500					7.	Horizontal (mechanical)	7.	200-300	7.	Alloy steel casting	7.	25-50		
40	Horn presses	7	500-1000					8.	Horizontal (hydraulic)	8.	300-500	8.	Non-ferrous casting	8.	50-100		
41	Horn press-adjustable bed (forming bending)	8	1000-5000					9.	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		
		9	Above 5000														

SITC Code 736.22 - Metal forming mancine-tools
Bending, forming, folding or flattering
machines, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Force (tons)	Code		Code	Control system	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
42	Horn press-adjustable bed (drawing)	1.	Upto 10			1.	With numerical control	1	Single column (mechanical)	1	Upto 5	1	Chilled iron casting	1.	Upto 1	1.	Turkey
50	Straight side presses	2.	10-20			2.	Without numerical control	2	Single column (hydraulic)	2	5-10	2	Grey iron casting	2.	1-2	2.	Imported
51	Straight-side press (forming, bending)	3.	20-40					3	Double column (mechanical)	3	10-25	3	Alloy iron casting	3.	2-5		
52	Straight-side press (drawing)	4.	40-75					4	Double column (hydraulic)	4.	25-50	4	Malleable iron casting	4.	5-10		
53	Straight-side press (extruding, flattening)	5.	75-150					5	Multi column (mechanical)	5	50-100	5	Spheroidal iron casting	5.	10-15		
60	Arch presses	6.	150-500					6	Multi column (hydraulic)	6	100-200	6	Carbon steel casting	6.	15-25		
61	Arch press (forming, bending)	7.	500-1000					7	Horizontal (mechanical)	7	200-300	7	Alloy steel casting	7.	25-50		
62	Arch press (drawing)	8.	1000-5000					8	Horizontal (hydraulic)	8	300-500	8	Non-ferrous casting	8.	50-100		
70	Pillar presses	9.	Above 5000					9	Others	9	Over 500	9	Steel fabrication	9.	Over 100		
71	Pillar press (forming, bending)																
72	Pillar press (drawing)																

SITC Code 736.22 - Metal forming machine-tools,
Bending, forming, folding or flattening
machines, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Force (tons)	Code		Code	Control system	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
73	Pillar press (extruding)	1.	Upto 10			1.	With numerical control	1	Single column (mechanical)	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
80	Press-brakes	2.	10-20			2.	Without numerical control	2	Single column (hydraulic)	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
81	Press-brake (forming, bending)	3.	20-40					3	Double column (mechanical)	3.	10-25	3.	Alloy iron casting	3.	2-5		
82	Press-brake (drawing)	4.	40-75					4	Double column (hydraulic)	4-	25-50	4.	Malleable iron casting	4.	5-10		
83	Press-brake (blanking)	5.	75-150					5	Multi column (mechanical)	5.	50-100	5.	Spheroidal iron casting	5.	10-15		
84	Press-brake (flattening, straightening)	6.	150-500					6	Multi column (hydraulic)	6.	100-200	6.	Carbon steel casting	6.	15-25		
85	Press-brake (others)	7.	500-1000					7	Horizontal (mechanical)	7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	1000-5000					8	Horizontal (hydraulic)	8.	300-500	8.	Non-ferrous casting	8.	50-100		
		9.	Above 5000					9	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		

SITC Code 736.22 - Metal forming machine-tools, Bending, forming, folding or flattening machines, metalworking

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1		Major Spec.-2		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
				Optional		Optional											
Code	Name	Code		Code		Code	Control system	Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
			SAME AS IN PAGE 4			1.	With numerical control	1.	Mechanical	1	Upto 5	1	Chilled iron casting	1.	Upto 1	1.	Turkey
						2.	Without numerical control	2.	Hydraulic	2	5-10	2	Grey iron casting	2.	1-2	2.	Imported
								9.	Others	3	10-25	3.	Alloy iron casting	3.	2-5		
										4	25-50	4.	Malleable iron casting	4.	5-10		
										5	50-100	5.	Spheroidal iron casting	5.	10-15		
										6	100-200	6.	Carbon steel casting	6.	15-25		
										7	200-300	7.	Alloy steel casting	7.	25-50		
										8	300-500	8.	Non-ferrous casting	8.	50-100		
										9	Over 500	9.	Steel fabrication	9	Over 100		
90	Bending and forming machines		Max. thickness rolled (mm)		Max.width (mm)												
91	Hand operated rolling machines	1.	Upto 4	1.	Upto 150												
92	Power operated bending rolls (sheets and plates)	2.	4-6	2.	150-650												
93	Power operated bending rolls (angles, bars, shapes)	3.	6-20	3.	650-1000												
94	Power operated bending rolls (tube bending)	4.	20-50	4.	1000-2000												
95	Power operated farming rolls	5.	50-100	5.	2000-4000												
96	Straightoning rolls	6.	Above 100	6.	Above 4000												
97	Rotary head and raw bending machines (for tubes and bars)																

SITC Code 736.22 - Metal forming machine-tools.
Bending, forming, folding or flattening
machines, metalworking.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max. thickness rolled(mm)	Code	Max.width (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
98	Bending and forming machines (others)	1.	Upto 4	1.	Upto 150	1.	With numerical control	1.	Mechanical	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
99	Others	2.	4-6	2.	150-650	2.	Without numerical control	2.	Hydraulic	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
		3.	6-20	3.	650-1000			9.	Others	3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	20-50	4.	1000-2000					4.	25-50	4.	Malleable iron casting	4.	5-10		
		5.	50-100	5.	2000-4000					5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	Above 100							6.	100-200	6.	Carbon steel casting	6.	15-25		
										7.	200-300	7.	Alloy steel casting	7.	25-50		
										8.	300-500	8.	Non-ferrous casting	8.	50-100		
										9.	Over 500	9.	Steel fabrication	9.	Over 100		

SITC Code 736.23 - Metal forming machine-tools.
Shearing, punching or notching machines
metalworking.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max.thickness (mild steel) (mm)	Code	Max.length to be sheared (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Shearing machines**	1	Upto 5	1	Upto 500	1	With numerical control			1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	5-10	2	500-1000	2	Without numerical control			2	5-10	2	Grey iron casting	2	1-2	2	Imported
01	Hand lever shears	3	10-15	3	1000-1500					3	10-25	3	Alloy iron casting	3	2-5		
02	Mechanical guillotine shears	4	15-20	4	1500-2000					4	25-50	4	Malleable iron casting	4	5-10		
03	Hydraulic guillotine shears	5	20-25	5	2000-3000					5	50-100	5	Spheroidal iron casting	5	10-15		
04	Circular shears	6	25-30	6	3000-4000					6	100-200	6	Carbon steel casting	6	15-25		
05	Slitting machines	7	Above 30	7	Above 4000					7	200-300	7	Alloy steel casting	7	25-50		
06	Trimming machines									8	300-500	8	Non-ferrous casting	8	50-100		
10	**Shearing machines for steel plants**									9	Over 500	9	Steel fabrication	9	Over 100		
11	Ingot, billet, slab shears							1.	Mechanical								
12	Scrap shears							2.	Hydraulic								
13	Bar cropping shears							3.	Others								

SITC Code 736.23 - Metal forming machine-tools
Shearing, punching or notching machines
metalworking.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing Characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Max.thicknes (Mild steel) (mm)	Code	Max.length to be sheared (mm)	Code	Control system	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
20	**Special application shears**	1	Upto 5	1	Upto 500	1	With numerical control	1	Mechanical	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
21	Round, flat, section cutting shears	2	5-10	2	500-1000	2	Without numerical control	2	Hydraulic	2	5-10	2	Grey iron casting	2	1-2	2	Imported
22	Universal shears (nibbling)	3	10-15	3	1000-1500			9	Others	3	10-25	3	Alloy iron casting	3	2-5		
23	Combined shearing, punching, notching machines	4	15-20	4	1500-2000					4	25-50	4	Malleable iron casting	4	5-10		
24	Punching machines	5	20-25	5	2000-3000					5	50-100	5	Spheroidal iron casting	5	10-15		
25	Notching machines	6	25-30	6	3000-4000					6	100-200	6	Carbon steel casting	6	15-25		
99	Others	7	Above 30	7	Above 4000					7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
										9	Over 500	9	Steel fabrication	9	Over 100		

STTC Code 741.21 - Furnace burners for liquid fuel (Automizers), for pulverized solid fuel or for gas - BOILER BURNERS and PARTS THEREOF

6-7		8		9		10		11		12		13		14		15
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origi
Code	Name	Code	Capacity (t/h)	Code	Fuel to be burned	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code
00	Horizontal firing burners	1.	Upto 10	1.	Bituminous coal			1.	Under suction	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1. Turke
		2.	10-20	2.	Brown coal			2.	Under pressure	2.	5-10	2.	Grey iron casting	2.	1-2	2. Impor
10	Vertical firing burners	3.	20-50	3.	Lignite			3.	Mechanical atomizing	3.	10-25	3.	Alloy iron casting	3.	2-5	
		4.	50-75	4.	Peat			4.	Steam atomizing	4.	25-50	4.	Malleable iron casting	4.	5-10	
20	Tangential firing burners	5.	75-100	5.	Fuel oil			5.	Air atomizing	5.	50-100	5.	Spheroidal iron casting	5.	10-15	
		6.	100-120	6.	Natural gas					6.	100-200	6.	Carbon steel casting	6.	15-25	
99	Others	7.	120-170	7.	Sulphite liquor					7.	200-300	7.	Alloy steel casting	7.	25-50	
		8.	170-200	8.	Waste					8.	300-500	8.	Non-ferrous casting	8.	50-100	
		9.	Over 200	9.	Other			9.	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100	

SITC Code 74131 - Industrial and laboratory electric furnaces, ovens and induction and dielectric heating equipment. and parts thereof (n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (tons/hour)	Code	Temperature °C	Code	KVA Rating x 1000	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm	Code	
00	Electric-Arc furnaces	1	Upto 1	1	Upto 250	1	Upto 5			1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
01	Indirect-Arc furnaces	2	1-2	2	250-500	2	5-10			2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
02	Direct-Arc furnaces	3	2-3	3	500-750	3	10-20			3	10-25	3	Boiler steel	3	40-50		
03	Combined Arc-resistance furnaces	4	3-5	4	750-1000	4	20-50			4	25-50	4	Alloy steel	4	Over 50		
10	Electro refining furnaces	5	5-10	5	1000-1250	5	50-100			5	50-100	5	High alloy steel				
20	Electro-metallurgy furnaces	6	10-20	6	1250-1500	6	Over 100			6	100-200	6	Stainless steel				
30	Induction furnaces	7	20-30	7	Over 1500					7	200-300	7	Non-ferrous materials				
31	Induction melting furnaces	8	30-50							8	300-500	9	Others				
32	Induction	9	Over 50							9	Over 500						

SITC Code 74131 - Industrial and laboratory electric furnaces, ovens and induction and dielectric heating equipment.and parts thereof (n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (tons/hour)	Code	Temperature °C	Code	KVA Rating x 1000	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
	heat-treatment furnaces		Chamber size m³	1.	Upto 250	1.	Upto 5			1.	Upto 5	1.	Mild steel upto 0.20 carbon (untested quality)	1.	Upto 20	1.	Turkey
40	Electric resistance furnaces	1.	Upto 5	2.	250-500	2.	5-10			2.	5-10	2.	Carbon steel above 0.20 C tested quality	2.	20-40	2.	Imported
41	Box furnaces	2.	5-10	3.	500-750	3.	10-20			3.	10-25	3.	Boiler steel	3.	40-50		
42	Pit furnaces	3.	10-20	4.	750-1000	4.	20-50			4.	25-50	4.	Alloy steel	4.	Over 50		
43	Car furnaces	4.	20-30	5.	1000-1250	5.	50-100			5.	50-100	5.	High alloy steel				
44	Rotary hearth furnaces	5.	Over 30	6.	1250-1500	6.	Over 100			6.	100-200	6.	Stainless steel				
45	Shaker hearth furnaces			7.	Over 1500					7.	200-300	7.	Non-ferrous materials				
46	Hydraulic pusher furnaces									8.	300-500	9.	Others				
										9.	Over 500						

SITC Code 74132 - Industrial and laboratory furnaces and ovens (non-electric) and parts thereof (n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output Tons/hour	Code	Temperature °C	Code	Fuel used	Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
00	Shaft furnaces	1	Upto 10	1	Upto 250	1	Solid			1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
01	Foundry cupola furnaces	2	10-20	2	250-500	2	Liquid			2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
02	Non-ferrous metallurgy smelting furnaces	3	20-30	3	500-750	3	Gaseous			3	10-25	3	Boiler steel	3	40-50		
03	Lime furnaces	4	30-40	4	750-1000	4	Combined			4	25-50	4	Alloy steel	4	Over 50		
04	Low-temperature carbonisation furnaces	5	40-50	5	1000-1250	5	Others			5	50-100	5	High alloy steel				
05	Gas producers	6	50-75	6	1250-1500					6	100-200	6	Stainless steel				
10	Tunnel furnaces	7	75-100	7	Above 1500					7	200-300	7	Non-ferrous materials				
11	High temp. firing fce.	8	100-150							8	300-500	9	Others				
12	Low-temperature furnaces carbonisation /pyrolysis	9	Over 150							9	Over 500						
13	Cyanamiding furnaces																

SITC Code 74132 - Industrial and laboratory furnaces and ovens (non-electric) and parts thereof (n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output Tons/hour	Code	Temperature °C	Code	Fuel used	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
14	Smelting furnaces	1	Upto 10	1	Upto 250	1	Solid			1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
20	Chamber furnaces	2	10-20	2	250-500	2	Liquid			2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
21	Circular furnaces	3	20-30	3	500-750	3	Gaseous			3	10-25	3	Boiler steel	3	40-50		
22	Muffle furnaces	4	30-40	4	750-1000	4	Combined			4	25-50	4	Alloy steel	4	Over 50		
23	Retorts	5	40-50	5	1000-1250	5	Others			5	50-100	5	High alloy steel				
24	Combustion chambers and burners	6	50-75	6	1250-1500					6	100-200	6	Stainless steel				
25	Coke and semicoke ovens	7	75-100	7	Above 1500					7	200-300	7	Non-ferrous materials				
30	Bath fces.	8	100-150							8	300-500	9	Others				
31	Reverberatory furnaces	9	Over 150							9	Over 500						
32	Converters furnaces																
33	Crucible furnaces																
34	Pot furnaces																
35	Refining furnaces																

SITC Code 74132 - Industrial and laboratory furnaces and ovens (non-electric) and parts thereof (n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Chamber size m^3	Code	Temperature ^oC	Code	Fuel used	Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
40	Pipe still	1.	Upto 25	1.	Upto 250	1.	Solid			1.	Upto .5	1.	Mild steel upto 0.20 carbon (untested quality)	1.	Upto 20	1.	Turkey
50	Heat-treatment furnaces	2.	25-50	2.	250-500	2.	Liquid			2.	.5-10	2.	Carbon steel above 0.20 C tested quality	2.	20-40	2.	Imported
		3.	50-100	3.	500-750	3.	Gaseous			3.	10-25	3.	Boiler steel	3.	40-50		
		4.	100-500	4.	750-1000	4.	Combined			4.	25-50	4.	Alloy steel	4.	Over 50		
		5.	Over 500	5.	1000-1250	5.	Others			5.	50-100	5.	High alloy steel				
				6.	1250-1500					6.	100-200	6.	Stainless steel				
				7.	Above 1500					7.	200-300	7.	Non-ferrous materials				
										8.	300-500						
99	Others									9.	Over 500	9.	Others				

Classification of Industrial Furnaces According to Design and Principle of Operation

Type of furnace	Name of Furnace	Process for which the furnace is used (examples)
1	2	3
1. Shaft furnaces	Blast furnace	Pig-iron manufacturing
	Cupola furnace	Cast-iron melting
	Non-ferrous metallurgy furnaces	Smelting copper, lead and nickel ores
	Lime furnace	Carbonate dissocation
	Internally heated low-temperature carbonization furnace	Low-temperature coal and peat carbonization
	Gas producers	Solid-fuel gasification
2. Multiple-hearth furnaces	Stoker furnace	Roasting pyrites, sulphur-containing ores, flotation concentrates, salts
3. With spraying of a pulverized solid fuel	Flash roaster	Roasting pyrites, flotation concentrates and non-ferrous metal ores
	Dryers	Drying various materials
4. Fluidized bed	Roaster	Roasting pyrites, non-ferrous metal ores and limestone Roasting alunite in the manufacture of alumina
	Low-temperature carbonization	Low-temperature carbonization of coal, peat and shale
	Regenerators	Removing carbonaceous deposits from the surface of a catalyst by burning
	Dryers	Drying granular-form materials
	Gas-producer	Gasification and pyrolysis
	Cracking oven	Destructive decomposition of tar and heavy petroleum residues in a bed of an inert granular heat-transfer agent
5. Rotary drum	Cement kiln	Forming cement-clinker minerals
	Sintering furnaces	Forming aluminates, silicates, etc. in manufacturing alumina and silicate materials
	Ferrite furnaces	Producing sodium ferrite
	Calcining	Dehydrating aluminium hydroxide, decomposition of sodium bicarbonate, etc.
	Roasting	Roasting pyrites, clay, magnesite, dolomite, etc.
	Sodium and barium sulphide furnaces	Sulphate reduction
	Thermophosphate furnaces	Decomposition, sintering, fusing phosphates and admixtures
	Dryers	Drying of ores, minerals, salts, and other materials
6. Tunnel (channel)	Firing	Firing refractories, ceramic items, etc.

Type of furnace	Name of Furnace	Process for which the furnace is used (examples)
1	2	3
	Pyrolysis	Low-temperature carbonization of shale, wood pyrolysis, etc.
	Cyanamide	Nitriding calcium carbide
	Smelting	Melting sulphur ore
	Dryers	Drying ceramic items
7.Chamber-type	Ovens for firing ceramic items	Firing ceramic items and refractories
	Glass-treating furnaces	Glass treating
	Circular furnaces (ring furnaces)	Firing brick and other ceramic items
	Muffle furnaces	Manufacturing HCl and sodium sulphate, converting yellow phosphorus to red phosphorus etc.
	Retorts	Decomposition of magnesium salts, low-temperature carbonization, charring and dry distillation of wood, etc.
	Combustion chambers and burners	Burning phosphorus to make phosphoric acid, methane chlorination, thermal oxidizing pyrolysis of methane, hydrogen chloride synthesis, etc.
	Coke- and semicoke ovens	Carbonization and low-temperature carbonization of coal
	Dryers	Drying of ceramics, refractories, salts, etc.
8.Bath-type	Reverberatory	Smelting steel by the open-hearth process, smelting and remelting non-ferrous metals, glass melting, burning sulphur, etc.
	Convertors	Smelting and remelting steel and non-ferrous metals, etc.
	Crucible	Remelting pig iron and thermal treating non-ferrous metals
	Pot	Melting glass, sodium hydroxide
	Refining	Refining non-ferrous metals
9.Pipe	Pipe still	Distillation of petroleum and petroleum products; cracking petroleum, petroleum products and coal tar; making acetic anhydride; hydrocarbon pyrolysis, etc.
10.Electric	Arc, indirect-heated (open arc)	Melting and refining non-ferrous metals and alloys
	Arc, direct-heated (enclosed arc)	Smelting high-grade steel, producing ferroalloys, electrocracking of methane and other hydrocarbons
	Resistance, indirect-heated	Nitriding calcium carbide, manufacturing silicon carbide and quartz glass
	Resistance, direct-heated	Manufacturing synthetic graphite, carbon disulphide, cyanides
	Combined	Manufacturing carbides, phosphorus sublimation, winning metals from ores and

Type of furnace	Name of Furnace	Process for which the furnace is used (examples)
1	2	3
		concentrates, electrolysis of fused electrolytes; aluminium oxide, sodium chloride, sodium hydroxide carnallite, manufacturing electrocorundum and fused refractories
	Induction	Remelting metals and alloys, making quartz glass.

SITC Code 74161 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as

- HEATING, VAPOURIZING AND CONDENSING. and parts thereof n.e.s.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Heating Surface (m^2)	Code	Inside shell diameter (m)	Code	Tube length (m)	Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
00	**Heat exchangers**	1	Upto 10	1	Upto 1	1	Upto 3	1	Shell and tube (fixed tube sheet)	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
01	Heat exchanger	2	10-50	2	1-2	2	3-4.5			2	5-10			2	20-40	2	Imported
02	Reboiler	3	50-100	3	2-3	3	4.5-6			3	10-25			3	40-50		
03	Cooler	4	100-500	4	3-5	4	Above 6	2	Shell and tube (U tubes)	4	25-50			4	Over 50		
04	Chiller	5	500-1000	5	Above 5					5	50-100						
05	Condenser	6	Above 1000					3	Shell and tube (floating head)	6	100-200	2	Carbon steel above 0.20 C tested quality				
06	Waste-heat boiler									7	200-300						
07	Heater							4	Double pipes	8	300-500						
08	Super-heater							5	Plates	9	Over 500	3	Boiler steel				
09	Vapourizer							6	Bayonet-type			4	Alloy steel				
10	Preheater							7	Spiral tube			5	High alloy steel				
								8	Integral finned tubes								
99	Others							9	Others			6	Stainless steel				
												7	Non-ferrous materials				
												9	Others				

Specifications based on standards of Tube Exchangers Manufacturers' Association U.S.A. (TEMA Standards)

SITC Code 74162 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as

- EVAPORATING AND CRYSTALLIZING, PARTS THEREOF(n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Heating Surface (m^2)	Code	Shell diameter metres (m)	Code	Height metres (m)	Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
01	Evaporators	1.	Upto 100	1.	Upto 3	1.	Upto 5	1.	Forced circulator	1.	Upto 5	1.	Mild steel upto 0.20 carbon (untested quality)	1.	Upto 20	1.	Turkey
		2.	100-500	2.	3-5	2.	5-6	2.	Short tube	2.	5-10	2.	Carbon steel above 0.20 C tested quality	2.	20-40	2.	Imported
		3.	500-1000	3.	5-6	3.	6-7	3.	Long tube vertical	3.	10-25	3.	Boiler steel	3.	40-50		
		4.	1000-2000	4.	6-7	4.	6-8	4.	Horizontal tube	4.	25-50	4.	Alloy steel	4.	Over 50		
		5.	2000-5000	5.	7-8	5.	8-9	5.	Agitated	5.	50-100	5.	High alloy steel				
		6.	5000-10,000	6.	8-10	6.	9-10	6.	Coil	6.	100-200	6.	Stainless steel				
		7.	Above 10,000	7.	10-12	7.	10-15	7.	Disc or cascade	7.	200-300	7.	Non-ferrous materials				
				8.	Above 12	8.	Over 15	8.	Sub-merged tube, forced circulation	8.	300-500						
								9.	Other	9.	Over 500						
10	Evaporation drum							1.	Vertical, vacuum type			9.	Others				
11	Vacuum pans																
99	Others																

SITC Code 74163 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as

- HEATING, COOKING AND ROASTING.(PARTS THEREOF (n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (tons/hour)	Code	Temperature °C	Code	Fuel used	Code	Process	Code	Weight (tons)	Code		Code	Plate thickness mm.	Code	
00	**Fluidized Bed (F.B.) furnaces**	1.	Upto 10	1.	Upto 250	1.	Solid fuels	1.	Drying	1.	Upto 5	1.	Mild steel upto 0.2) carbon (untested quality)	1.	Upto 20	1.	Turkey
01	Fluidized bed roaster	2.	10-20	2.	250-500	2.	Liquid fuels	2.	Low temp. carbonisation	2.	5-10	2.	Carbon steel above 0.20 C tested quality	2.	20-40	2.	Imported
02	Low temperature carbonisation fces.	3.	20-30	3.	500-750	3.	Gaseous fuel	3.	Chemical dissociation	3.	10-25	3.	Boiler steel	3.	40-50		
03	Cracking ovens	4.	30-40	4.	750-1000	4.	Combined	4.	Solid-fuel gasification	4.	25-50	4.	Alloy steel	4.	Over 50		
10	**Rotary Drum (R.D.) furnaces**	5.	40-50	5.	1000-1250	9.	Others	5.	Roasting	5.	50-100	5.	High alloy steel				
11	R.D. roaster	6.	50-75	6.	1250-1500			6.	Calcining	6.	100-200	6.	Stainless steel				
12	R.D. calcining furnaces	7.	75-100	7.	1500-2000			7.	Sintering	7.	200-300	7.	Non-ferrous materials				
13	R.D. sintering furnaces	8.	100-150	8.	Over 2000			8.	Cracking	8.	300-500	9.	Others				
14	R.D. cement kilns	9.	Over 150					9.	Others	9.	Over 500						
20	**Flash roaster pulverised solid fuel**																
30	**Multiple hearth stoker furnace**																
40	**Ovens**																
50	Straight grate furnace																
99	Others (nia)																

Fabricated equipment

SITC Code 74164 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as - DRYING AND PARTS THEREOF(n.e.s.)

PAGE: 1

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Tons per hour (t/h)	Code		Code		Code	Method of Drying	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
01	Tray or compartment dryers	1	Upto 1					1	Through circulation	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
02	Tray-truck dryer	2	1-5					2	Vacuum	2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
03	Stationary tray dryer	3	5-10					3	Counter flow	3	10-25	3	Boiler steel	3	40-50		
		4	10-25					4	Parallel flow	4	25-50	4	Alloy steel	4	Over 50		
		5	25-50					5	Centre exhaust	5	50-100	5	High alloy steel				
		6	50-75					6	Direct heat	6	100-200	6	Stainless steel				
		7	75-100					7	Indirect heat	7	200-300	7	Non-ferrous materials				
		8	Above 100					8	Steam tube	8	300-500	9	Others				
					Length in meters			9	Others	9	Over 500						
10	Tunnel dryers			1	Upto 5												
11	Tunnel belt dryers			2	5-10												
12	Tunnel screw-conveyor dryers			3	10-15												
13	Tunnel truck dryers			4	15-20												
				5	20-25												
				6	25-50												
				7	Above 50												
20	Conveyor dryers																
21	Screw conveyor dryers																
22	Vibrating conveyor dryers																
23	Pneumatic conveyor dryers single stage																
24	Pneumatic conveyor dryers multi stage																

SITC Code 74164 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as DRYING and parts thereof, n.e.s

PAGE: 2

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code		Code		Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
30	Rotary Dryers	1	Upto 1							1.	Upto 5	1	Mild steel	1.	Upto 20	1.	Turkey
		2	1-5							2.	5-10		upto 0.20	2.	20-40	2.	Imported
40	Drum Dryers (D.D.)	3	5-10					1	Single atmosph.	3.	10-25		carbon	3	40-50		
41	Twin drum dryers	4	10-25					2	Single vacuum	4.	25-50		(untested	4.	Over 50		
		5	25-50				Diameter (m)	3	Double atmos.	5.	50-100		quality)				
50	Spray Dryers	6	50-75			1	Upto 3	4	Double vacuum	6.	100-200	2	Carbon steel				
		7	75-100			2	3-5			7.	200-300		above 0-20 C				
60	Agitated Dryers	8	Above 100			3	5-10	9	Others	8.	300-500		tested				
61	Agitated dryers rotary				Length in meters	4	Above 10			9.	Over 500		quality				
62	Agitated dryers turbo			1.	Upto 5							3	Boiler steel				
63	Agitated double cone			2.	5-10							4	Alloy steel				
				3.	10-15							5	High alloy				
70	Pan Dryers			4.	15-20			1	Atmospheric				steel				
71	Flash dryers			5.	20-25			2	Vacuum			6	Stainless				
				6.	25-50								steel				
80	Gravity Dryers			7.	Above 50							7	Non-ferrous				
81	Pellet coolers and dryers												materials				
82	Multi-louvre dryers																
83	Spouted bed							9	Others			9.	Others				
90	Coolers																
99	Others																

SITC Code 74164 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as -DRYING AND PARTS THEREOF (n.e.s.)

PAGE: 2

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	tons per hour (t/h)	Code	length (m)	Code		Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
30	**Rotary Dryers**	1	up to 1	1	up to 5					1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
40	**Drum Dryers (D.D.)**	2	1 - 5	2	5 - 10			1	Single atmosph.	2	5-10			2	2 -40	2	Imported
41	Twin drum dryers	3	5 - 10	3	10 - 15		Diameter (m)	2	Single vacuum	3	10-25			3	4 -50		
50	**Spray Dryers**	4	10 - 25	4	15 - 20	1	Upto 3	3	Double atmos.	4	25-50	2	Carbon steel above 0-20 C tested quality	4	Over 50		
		5	25 - 50	5	20 - 25	2	3-5	4	Double vacuum	5	50-100						
60	**Agitated Dryers**	6	50 - 75	6	25 - 50	3	5-10	9	Others	6	100-200	3	Boiler steel				
61	Agitated dryers rotary	7	75 - 100	7	Above 50	4	Above 10			7	200-300	4	Alloy steel				
62	Agitated dryers turbo	8	Above 100							8	300-500	5	High alloy steel				
63	Agitated double cone									9	Over 500	6	Stainless steel				
70	**Pan Dryers**							1	Atmospheric			7	Non-ferrous materials				
71	Flash dryers							2	Vacuum			9	Others				
80	**Gravity Dryers**																
81	Pellet coolers and dryers							9	Others								
82	Multi-louvre dryers																
83	Spouted bed																
90	**Coolers**																
99	Others																

SITC Code 74165 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as

REACTION PROCESS. AND PARTS THEREOF(n.e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Ori	
Code	Name	Code	Volume (m^3)	Code	Pressure (atm)	Code	Reaction	Code	Process	Code	Weight (tons)	Code	Main body material	Code	Plate thickness mm.	Code	
[illegible]	Reaction vessels	1	Upto 10	1	Upto 10	1	Catalytic	1	Stirred mechanically	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turk
01	Ammonia converter	2	10-50	2	10-25	2	Non-catalytic	2	Tubular construction	2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Impor
02	Urea reactor	3	50-100	3	25-50	9	Others	3	Fluidized bed	3	10-25	3	Boiler steel	3	40-50		
03	Hydrolyzer	4	100-250	4	50-75			4	Packed materials	4	25-50	4	Alloy steel	4	Over 50		
04	Catalyst tower	5	250-750	5	75-100			5	Plate baffles	5	50-100	5	High alloy steel				
05	Desulfurization reactor	6	750-1500	6	100-500			6	Spray arrangement	6	100-200	6	Stainless steel				
06	Methanol converter	7	1500-3000	7	500-1000			9	Others	7	200-300	7	Non-ferrous materials				
07	Shift converter	8	3000-5000	8	1000-1500					8	300-500	9	Others				
08	Reaction tank	9	Over 5000	9	Over 1500					9	Over 500						
09	Reaction cyclone																
10	Deactivator																
11	Decomposer																
12	Polymeriser																
20	Hydrostatic reactor																
21	SO_2 converter																
22	Reformer																
24	Methanator																
99	Others																

SITC Code 74166 - Machinery, plant and similar laboratory equipment, whether or not electrically heated for the treatment of materials by a process involving a change of temperature, such as - DISTILLING, RECTIFYING, REFINING, SCRUBBING AND ABSORBING AND PARTS THEREOF (n e.s.)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Cubic Meters (m3)	Code	Pressure (atmos.)	Code	Temperature °C	Code	Process	Code	Weight (tons)	Code	Main body material	Code	Plate thickness mm.	Code	
00	**Chemical Process Columns**	1	Upto 20	1	Upto 10	1	Upto -100C	1.	Plate baffles	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1.	Turkey
01	Distillation column	2	20-100	2	10-20	2	-100- -50	2.	Packed materials	2	5-10	2	Carbon steel above 0.20 C tested quality	2.	20-40	2.	Imported
02	Scrubbing column	3	100-200	3	20-30	3	-50-0	3.	Spray arrangement	3	10-25	3.	Boiler steel	3	40-50		
03	Absorption column	4	200-500	4	30-40	4	0-250	4.	Stirred mechanically	4	25-50	4.	Alloy steel	4	Over 50		
04	Rectifying column	5	500-1500	5	40-50	5	250-500	9	Others	5	50-100	5.	High alloy steel				
05	Refining column	6	1500-3000	6	50-60	6	500-750			6	100-200	6.	Stainless steel				
06	Topping column	7	3000-6000	7	60-75	7	750-1000			7	200-300	7.	Non-ferrous materials				
07	Stripping column	8	6000-10000	8	75-100	8	1000-1500			8.	300-500	9.	Others				
08	Wash column	9	Over 10000	9	Over 100	9	Over 1500			9.	Over 500						
09	Adsorption column																
10	Regeneration column																
11	Separation column																
12	Saturation column																
13	Desaturation column																
14	Desorption column																
99	Others																

SITC Code 74210 - Reciprocating pumps

6-7		8		9-10				11		12-14						15	
Basic Machine Name		Major Specification (Capacity)		Major Spec. (optional) 1		2		Type		Manufacturing Characteristics 1		2		3		Origin	
Code	Name	Code	Capacity (m^3/h)	Code	Water head (m)	Code	Material to be handled	Code		Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	Origin
00	Piston pumps	1.	Upto 1	1.	Upto 25	1.	Cold clear and little contamination	1.	Horizontal	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
01	Single-acting piston pumps	2.	1-10	2.	25-50	2.	Hot clear and little contamination	2.	Vertical	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Imported
02	Double-acting piston pumps	3.	10-100	3.	50-100	3.	Cold dirty and muddy			3.	10-25	3.	Alloy iron casting	3.	2-5		
10	Plunger pumps	4.	100-500	4.	100-200	4.	Hot dirty and muddy			4.	25-50	4.	Malleable iron casting	4.	5-10		
11	Single-acting plunger pumps	5.	500-1000	5.	200-300	5.	Corrosive			5.	50-100	5.	Spheroidal iron casting	5.	10-15		
12	Double-acting plunger pumps	6.	1000-5000	6.	300-500	6.	Viscous			6.	100-200	6.	Carbon steel casting	6.	15-25		
20	Diaphragm pumps	7.	5000-10.000	7.	500-1000	7.	Abrasive			7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	10000-30000	8.	1000-3000	8.	SOLID CARRYING misc. slurries			8.	300-500	8.	Non-ferrous casting	8.	50-100		
99	Others	9.	Over 30.000	9.	Over 3000	9.	Others	9	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		

SITC Code 74220 - Centrifugal pumps

6-7		8		9-10				11		12-14						15	
Basic Machine Name		Major Specification (Capacity)		Major Spec. (optional)				Type		Manufacturing characteristics						Origin	
				1		2				1		2		3			
Code	Name	Code	Capacity (m^3/h)	Code	Water head (m)	Code	Material to be handled	Code		Code	Weight(tons)	Code	Main body material	Code	Max. Componene Weight(tons)	Code	Origin
00	Single stage centrifugal pumps	1	Upto 1	1	Upto 25	1	Cold clear and little contamination	1	Horizontal	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	- circular casing	2	1-10	2	25-50	2	Hot clear and little contamination	2	Vertical	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	- volute or spiral casing	3	10-100	3	50-100	3	Cold dirty and muddy			3	10-25	3	Alloy iron casting	3	2-5		
03	- diffuser or turbine casing	4	100-500	4	100-200	4	Hot dirty and muddy			4	25-50	4	Malleable iron casting	4	5-10		
10	Multiple stage centrifugal pumps	5	500-1000	5	200-300	5	Corrosive			5	50-100	5	Spheroidal iron casting	5	10-15		
11	- Circular casing	6	1000-5000	6	300-500	6	Viscous			6	100-200	6	Carbon steel casting	6	15-25		
12	- volute or spiral casing	7	5000-10.000	7	500-1000	7	Abrasive			7	200-300	7	Alloy steel casting	7	25-50		
13	- diffuser or turbine casing	8	10.000-30.000	8	1000-3000	8	SOLID CARRYING misc. slurries			8	300-500	8	Non-ferrous casting	8	50-100		
20	Axial flow pumps	9	Over 30.000	9	Over 3000	9	Others			9	Over 500	9	Steel fabrication	9	Over 100		
99	Others							9	Others								

SITC Code 74230 - Rotary pumps

Basic Machine Name		Major Specification (Capacity)		Major Spec. (optional)				Type		Manufacturing characteristics						Origin	
				1		2				1		2		3			
Code	Name	Code	Capacity (m^3/h)	Code	Water head (m)	Code	Material to be handled	Code	Type	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	Origin
00	Gear pumps	1	Upto 1	1	Upto 25	1	Cold clear and little contamination	1	Horizontal	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	1-10	2	25-50	2	Hot clear and little contamination	2	Vertical	2	5-10	2	Grey iron casting	2	1-2	2	Imported
10	Screw pumps	3	10-100	3	50-100	3	Cold dirty and muddy			3	10-25	3	Alloy iron casting	3	2-5		
		4	100-500	4	100-200	4	Hot dirty and muddy			4	25-50	4	Malleable iron casting	4	5-10		
20	Sliding-vane pumps	5	500-1000	5	200-300	5	Corrosive			5	50-100	5	Spheroidal iron casting	5	10-15		
		6	1000-5000	6	300-500	6	Viscous			6	100-200	6	Carbon steel casting	6	15-25		
30	Roller pumps	7	5000-10.000	7	500-1000	7	Abrasive			7	200-300	7	Alloy steel casting	7	25-50		
		8	10000-30000	8	1000-3000	8	SOLID CARRYING misc. slurries			8	300-500	8	Non-ferrous casting	8	50-100		
40	Straight lobe pumps	9	Over 30.000	9	Over 3000					9	Over 500	9	Steel fabrication	9	Over 100		
99	Others					9	Others	9	Others								

SITC Code 74240 - Jet and electro-magnetic pumps

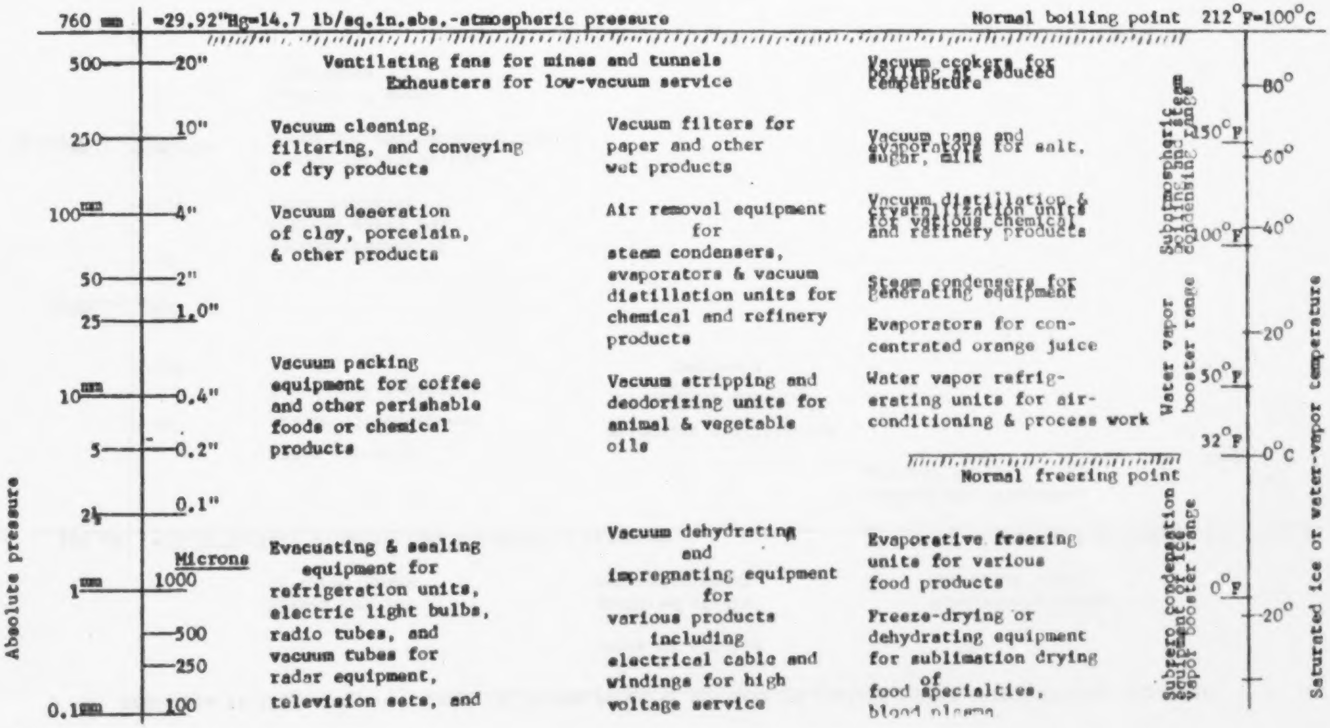
Basic Machine Name		Major Specification (Capacity)		Major Spec. (optional)				Type		Manufacturing characteristics						Origin	
				1		2				1		2		3			
Code	Name	Code	m^3/hours	Code	Water Head (m)	Code	Materials to be handled	Code	Type	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	Origin
00	Jet pumps	1	Upto 1	1	Upto 25	1	Cold clear and little contamination	1	Horizontal	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	-Ejector pumps	2	1-10	2	25-50	2	Hot clear and little contamination	2	Vertical	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	-Injector pumps	3	10-100	3	50-100	3	Cold dirty and muddy			3	10-25	3	Alloy iron casting	3	2-5		
10	Electromagnetic pumps	4	100-500	4	100-200	4	Hot dirty and muddy			4	25-50	4	Malleable iron casting	4	5-10		
11	A.C. electromagnetic pumps	5	500-1000	5	200-300	5	Corrosive			5	50-100	5	Spheroidal iron casting	5	10-15		
12	D.C. electromagnetic pumps	6	1000-5000	6	300-500	6	Viscous			6	100-200	6	Carbon steel casting	6	15-25		
		7	5000-10.000	7	500-1000	7	Abrasive			7	200-300	7	Alloy steel casting	7	25-50		
		8	10.000-30.000	8	1000-3000	8	SOLID CARRYING misc. slurries			8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 30.000	9	Over 3000	9	Others	9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
99	Others																

SITC Code 74312 Air pumps, vacuum pumps and air or gas compressors
- Vacuum pumps

6 - 7		8		9		10		11		12		13		14		15	
Basic Machine Name		Major Specification (Capacity)		Major Spec. (optional) 1		2		Type		Manufacturing characteristics 1		2		3		Origin	
Code	Name	Code	Capacity (m^3/min)	Code	Absolute pressure (mm Hg)	Code	Medium	Code	Description	Code	Weight(tons)	Code	Plain body Material	Code	Max. Component Weight(tons)	Code	Origin
00	Piston vacuum pumps	1	Upto 1	1	Above 500	1	Air	1	Horizontal	1	Upto 5	1	Chilled	1	Upto 1	1	Turkey
01	Single-stage	2	1-10	2	500-250	2	Diverse	2	Vertical	2	5-10		iron	2	1-2	2	Imported
02	Multi-stage	3	10-50	3	250-100		gases	3	Combination	3	10-25		casting	3	2-5		
		4	50-100	4	100-50					4	25-50	2	Grey iron	4	5-10		
10	Centrifugal vacuum	5	100-500	5	50-25					5	50-100		casting	5	10-15		
	pumps	6	500-1000	6	25-10					6	100-200	3	Alloy iron	6	15-25		
11	Single-stage	7	1000-3000	7	10-5					7	200-300		casting	7	25-50		
12	Multi- stage	8	3000-6000	8	5-1					8	300-500	4	Malleable	8	50-100		
		9	Over 6000	9	Below 1					9	Over 500		iron casting	9	Over 100		
20	Rotary vacuum pumps											5	Spheroidal				
21	Sliding-vane rotary												iron casting				
	vacuum pumps											6	Carbon steel				
22	Straight lobe												casting				
	rotary vacuum pumps											7	Alloy steel				
23	Water-ring rotary					9	Others	9	Others				casting				
30	Ejectors											8	Non-ferrous				
													casting				
31	Steam jet ejectors											9	Steel				
32	Water jet ejectors												fabrication				
99	Others																

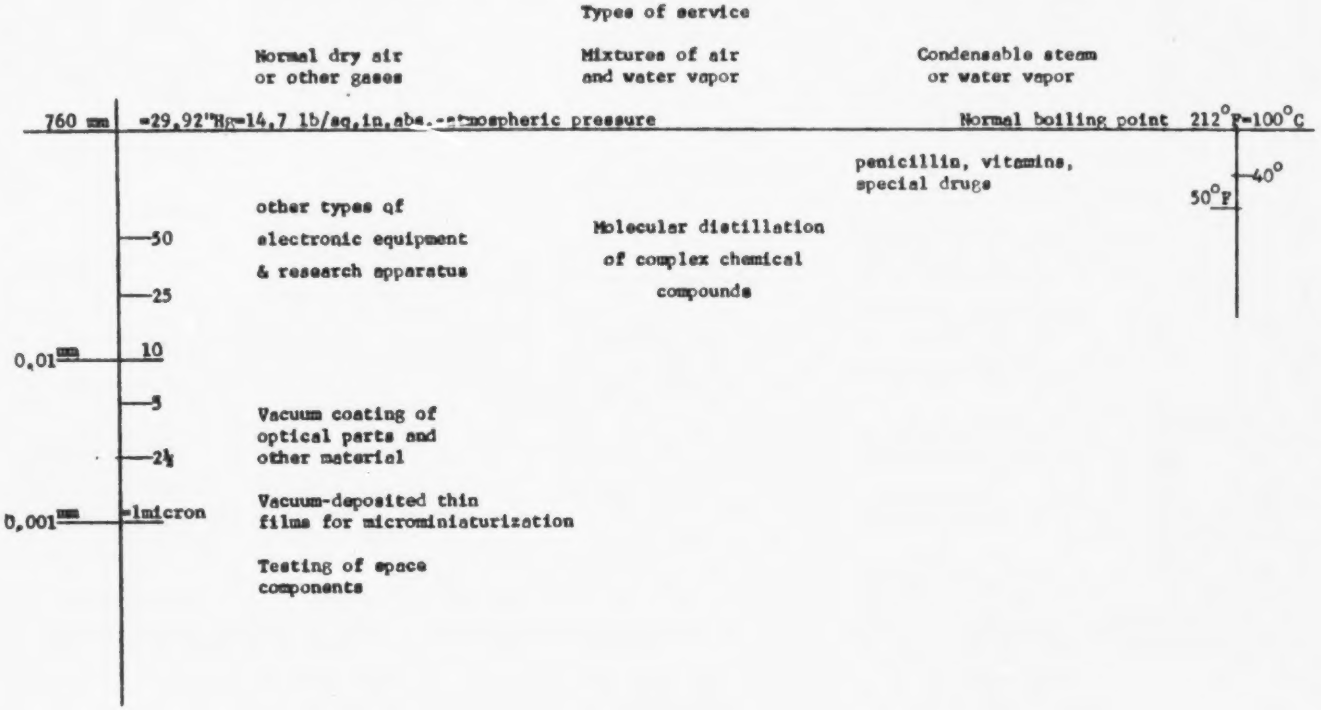
ANNEXURE: Level of vacuum normally required to perform common manufacturing processes.

STTC Code 74.312 Annex_ure - Level of vacuum normally required to perform common manufacturing processes.


Absolute pressure
Microns
Normal boiling point 212°F=100°C
Normal freezing point
Subatmospheric steam boiling and condensing range
Water vapor booster range
Subzero condensation equipment of ice vapor booster range
Saturated ice or water-vapor temperature
150°F
100°F
50°F
32°F
0°F
80°
60°
40°
20°
0°C
-20°

Absolute pressure		Types of service: Normal dry air or other gases	Mixtures of air and water vapor	Condensable steam or water vapor	Saturated ice or water-vapor temperature
760 mm	=29.92"Hg=14.7 lb/sq.in.abs.-atmospheric pressure			Normal boiling point	212°F=100°C
500	20"	Ventilating fans for mines and tunnels Exhausters for low-vacuum service		Vacuum cookers for boiling at reduced temperature	80°
250	10"	Vacuum cleaning, filtering, and conveying of dry products	Vacuum filters for paper and other wet products	Vacuum pans and evaporators for salt, sugar, milk	150°F 60°
100 mm	4"	Vacuum deaeration of clay, porcelain, & other products	Air removal equipment for steam condensers, evaporators & vacuum distillation units for chemical and refinery products	Vacuum distillation & crystallization units for various chemical and refinery products	100°F 40°
50	2"			Steam condensers for generating equipment	
25	1.0"			Evaporators for concentrated orange juice	20°
10 mm	0.4"	Vacuum packing equipment for coffee and other perishable foods or chemical products	Vacuum stripping and deodorizing units for animal & vegetable oils	Water vapor refrigerating units for air-conditioning & process work	50°F
5	0.2"			Normal freezing point	32°F 0°C
2½	0.1"				
1 mm	1000	Evacuating & sealing equipment for refrigeration units, electric light bulbs, radio tubes, and vacuum tubes for radar equipment, television sets, and	Vacuum dehydrating and impregnating equipment for various products including electrical cable and windings for high voltage service	Evaporative freezing units for various food products Freeze-drying or dehydrating equipment for sublimation drying of food specialties, blood plasma	0°F -20°
	500				
	250				
0.1 mm	100				

SITC Code 74.312 Annex_ure - Level of vacuum normally required to perform common manufacturing processes.



SITC Code 743.13 Air pumps, vacuum pumps and air or gas compressors
- air or gas compressors

Basic Machine Name		Major Specification (Capacity)		Major Spec. (optional) 1		Major Spec. (optional) 2		Type		Manufacturing characteristics 1		Manufacturing characteristics 2		Manufacturing characteristics 3		Origin	
Code	Name	Code	Capacity (m^3/min)	Code	Pressure (KG/cm^2)	Code	Medium	Code	Type	Code	Weight(tons)	Code	Plain body material	Code	Max. Component Weight(tons)	Code	Origin
00	Reciprocating piston compressors	1	Upto 1	1	Upto 4	1	Air	1	Horizontal	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Single-stage	2	1-10	2	4-8	2	Diverse gases	2	Vertical	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Multi-stage	3	10-50	3	8-25			3	Combination	3	10-25	3	Alloy iron casting	3	2-5		
10	Centrifugal compressors	4	50-100	4	25-50					4	25-50	4	Malleable iron casting	4	5-10		
11	Single-stage	5	100-1000	5	50-100					5	50-100	5	Spheroidal iron casting	5	10-15		
12	Multi-stage	6	1000-2000	6	100-200					6	100-200	6	Carbon steel casting	6	15-25		
20	Rotary compressors	7	2000-3000	7	200-500					7	200-300	7	Alloy steel casting	7	25-50		
21	Sliding-vane rotary compressors	8	3000-6000	8	500-1000					8	300-500	8	Non-ferrous casting	8	50-100		
22	Straight lobe rotary compressors	9	Over 6000	9	Over 1000					9	Over 500	9	Steel fabrication	9	Over 100		
23	Screw compressors																
30	Turbo-compressors																
40	Axial flow compressors																
99	Others																

SITC Code 74341 -FANS, BLOWERS AND THE LIKE-FANS

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity (m^3/sec)	Code	Water head (mm)	Code	Medium	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	Origin
00	Radial fans	1	Upto 1	1	Upto 10	1	Air	1	Forced-draught	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Single-suction	2	1-10	2	10-25	2	Diverse gases	2	Induced-draught	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Double-suction	3	10-100	3	25-50			3	Exhaust	3	10-25	3	Alloy iron casting	3	2-5		
10	Axial-flow fans	4	100-250	4	50-100					4	25-50	4	Malleable iron casting	4	5-10		
		5	250-500	5	100-250					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	500-750	6	250-500					6	100-200	6	Carbon steel casting	6	15-25		
		7	750-1000	7	500-750					7	200-300	7	Alloy steel casting	7	25-50		
		8	1000-2000	8	750-1000					8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 2000	9	Over 1000					9	Over 500	9	Steel fabrication	9	Over 100		
99	Others					9	Others	9	Others								

SITC Code 74342 - FANS,BLOWERS AND THE LIKE-BLOWERS

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic - 1		Manufacturing characteristic - 2		Manufacturing characteristic - 3		Origin	
Code	Name	Code	Capacity (m^3/min)	Code	Pressure (KG/cm^2)	Code	Medium	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	Origin
00	Centrifugal blowers	1	Upto 1	1	Upto 1.5	1	Air	1	Straight blades	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	1-10	2	1.5-2.0	2	Diverse gases	2	Forward curved blades	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	10-50	3	2.0-2.5			3	Backward curved blades	3	10-25	3	Alloy iron casting	3	2-5		
		4	50-100	4	2.5-3.0					4	25-50	4	Malleable iron casting	4	5-10		
		5	100-1000	5	Over 3.0					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	1000-2000							6	100-200	6	Carbon steel casting	6	15-25		
10	Axial-flow blowers	7	2000-3000					1	Disk type	7	200-300	7	Alloy steel casting	7	25-50		
		8	3000-6000					2	Propeller type	8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 6000							9	Over 500	9	Steel fabrication	9	Over 100		
99	Others					9	Others	9	Others								

SITC Code 74351 - Centrifuges.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	(m^3/hour)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
00	Centrifuges-sedimentation	1	Upto 10					1	Batch-ultra centrifuge	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
		2	10-20					2	Tubular-super	2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
		3	20-30					3	Disc-solid wall	3	10-25	3	Boiler steel	3	40-50		
		4	30-50					4	Disc-peripheral nozzle/valves /annular	4	25-50	4	Alloy steel	4	Over 50		
		5	50-75					5	Solid bowl	5	50-100	5	High alloy steel				
		6	75-100					6	Continuous decanter	6	100-200	6	Stainless steel				
		7	Over100					7	Helical conveyor conical-bowl/ cylindrical-conical	7	200-300	7	Non-ferrous materials				
								9	Others	8	300-500	9	Others				
			Tons/hour							9	Over 500						
10	Centrifuges-filtering	1	Upto 10					1	Link suspended batch centrifuge								
		2	10-20					2	Top suspended basket								
		3	20-30					3	Automatic-batch								
		4	30-50					4	Reciprocating								
		5	50-75														
		6	75-100														
		7	Over 100														

SITC Code 74351 - Centrifuges.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	(Tons /hour)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
10	Centrifuges-filtering	1.	Upto 10					5.	-continuous Oscillating-basket	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
		2.	10-20							2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
		3.	20-30							3	10-25	3	Boiler steel	3	40-50*		
		4.	30-50							4	25-50	4	Alloy steel	4	Over 50		
		5.	50-75							5	50-100	5	High alloy steel				
		6.	75-100							6	100-200	6	Stainless steel				
		7.	Over 100							7	200-300	7	Non-ferrous materials				
										8	300-500						
										9	Over 500						
99	Others							9	Others			9	Others				

SITC Code 74361 - Filtering and purifying machinery and apparatus for gases.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	1000 m^3/hr	Code		Code		Code	Description	Code	Weight (tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
00	Electrostatic precipitators	1	Upto 100					1	Single zone	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
01	Dry electrostatic precipitators	2	100-200					2	Multiple zones	2	5-10			2	20-40	2	Imported
02	Wet electrostatic precipitators	3	200-300							3	10-25			3	40-50		
		4	300-400							4	25-50			4	Over 50		
		5	400-500							5	50-100	2	Carbon steel above 0.20 C tested quality				
		6	500-600		Diameter M					6	100-200						
10	Cyclones	7	600-800	1	Upto 3					7	200-300						
11	Single cyclones	8	800-1000	2	3-5					8	300-500						
12	Multi cyclones	9	Over 1000	3	5-7					9	Over 500	3	Boiler steel				
				4	7-9							4	Alloy steel				
20	Spray towers			5	9-11							5	High alloy steel				
				6	11-15							6	Stainless steel				
30	Venturi Scrubbers			7	Over 15							7	Non-ferrous materials				
40	Disintegrators																
50	Air filter																
99	Others							9	Others			9	Others				

SITC Code74362 - Filtering and purifying machinery and apparatus for liquids.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Tons/hour	Code	Diameter (M)	Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
00	**Thickners and Decantors**	1	Upto 10	1	Upto 10					1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
01	Batch thickners and decantors	2	10-25	2	10-20					2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
02	Cone thickners and decantors	3	25-50	3	20-30					3	10-25	3	Boiler steel	3	40-50		
03	Superstructure thickners and decantors	4	50-100	4	30-50					4	25-50	4	Alloy steel	4	Over 50		
04	Multiple trays thickners and decantors	5	100-200	5	Over 50					5	50-100	5	High alloy steel				
10	**Clarifying filters**	6	200-500							6	100-200	6	Stainless steel				
11	Continuous clarifying filters	7	500-1000							7	200-300	7	Non-ferrous materials				
12	Disc-plate clarifying filters	8	1000-5000							8	300-500	9	Others				
13	Cartridge clarifying	9	Over 5000							9	Over 500						

SITC Code 74362 - Filtering and purifying machinery and apparatus for liquids.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Tons/hour	Code	Diameter (M)	Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
	filters	1.	Upto 10	1.	Upto 10					1.	Upto 5	1.	Mild steel upto 0.20 carbon (untested quality)	1.	Upto 20	1.	Turkey
20	Gravity filters	2.	10-25	2.	10-20					2.	5-10			2.	20-40	2.	Imported
		3.	25-50	3.	20-30					3.	10-25			3.	40-50		
21	Bag filters	4.	50-100	4.	30-50					4.	25-50			4.	Over 50		
22	Sand filters	5.	100-200	5.	Over 50					5.	50-100						
		6.	200-500							6.	100-200	2.	Carbon steel above 0.20 C tested quality				
23	Pulverised anthracite filters	7.	500-1000							7.	200-300						
		8.	1000-5000							8.	300-500						
		9.	Over 5000							9.	Over 500						
24	False bottom filters											3.	Boiler steel				
												4.	Alloy steel				
							Pressure kg/cm^2					5.	High alloy steel				
30	Pressure filters					1.	Upto 20					6.	Stainless steel				
						2.	20-50										
31	Leaf pressure filters					3.	50-100					7.	Non-ferrous materials				
						4.	100-200										
						5.	200-400										
32	Plate pressure filters					6.	Above 400					9.	Others				
33	Tubular pressure filters																
34	Rotating pressure filters																

SITC Code 74362 - Filtering and purifying machinery and apparatus for liquids.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Tons/hour	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
40	**Vacuum filters**	1	Upto 10				Vacuum kg/cm^2 x10^2		SAME AS IN PAGE 1	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1	Turkey
41	Continuous drum filter	2	10-25			1	Upto 50			2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2	Imported
42	Disc vacuum filter	3	25-50			2	50-20			3	10-25	3	Boiler steel	3	40-50		
43	Tilting pan vacuum filter	4	50-100			3	20-10			4	25-50	4	Alloy steel	4	Over 50		
44	Belt vacuum filter	5	100-200			4	10-5			5	50-100	5	High alloy steel				
50	**Press filters**	6	200-500		Area sq. meters	5	Under 5			6	100-200	6	Stainless steel				
51	Plate and frame press filter	7	500-1000	1	Upto 1000					7	200-300	7	Non-ferrous materials				
52	Circular plate press filter	8	1000-5000	2	1000-5000					8	300-500	9	Others				
53	With hydraulic	9	Over 5000	3	5000-10000					9	Over 500						
				4	Over 10000												

SITC Code 74362 - Filtering and purifying machinery and apparatus for liquids.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Tons/hour	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
	press filter	1.	Upto 10	1.	Upto 10					1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20	1.	Turkey
60	Presses	2.	10-25	2.	10-20					2	5-10	2	Carbon steel above 0.20 C tested quality	2	20-40	2.	Imported
61	Screw press	3.	25-50	3.	20-30					3	10-25	3	Boiler steel	3	40-50		
62	Roller mill press	4.	50-100	4.	30-50					4	25-50	4	Alloy steel	4	Over 50		
63	Disc press	5.	100-200	5.	Over 50					5	50-100	5	High alloy steel				
70	Strainer	6.	200-500							6	100-200	6	Stainless steel				
		7.	500-1000							7	200-300	7	Non-ferrous materials				
		8.	1000-5000							8	300-500						
		9.	Over 5000							9	Over 500						
99	Others											9	Others				

SITC Code 744.11 - Works, trucks mechanically propelled of the types used in factories warehouses, dock areas or air-ports for short distance transport or handling of goods, tractors of the type used on railway station platforms.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Carrying capacity (t)	Code	Max. operating speed(km/h)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Forklift trucks	1	Upto 1	1	Upto 10					1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	1-2	2	10-20					2	5-10	2	Grey iron casting	2	1-2	2	Imported
10	An/Fo trucks	3	2-3	3	20-30					3	10-25	3	Alloy iron casting	3	2-5		
		4	3-4	4	30-50					4	25-50	4	Malleable iron casting	4	5-10		
		5	4-5	5	Over 50					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	Over 5							6	100-200	6	Carbon steel casting	6	15-25		
20	Dump trucks	1	Upto 10	1	Upto 20					7	200-300	7	Alloy steel casting	7	25-50		
30	Trailer trucks	2	10-20	2	20-30					8	300-500	8	Non-ferrous casting	8	50-100		
		3	20-30	3	30-40					9	Over 500	9	Steel fabrication	9	Over 100		
		4	30-50	4	40-50												
		5	50-80	5	50-60												
		6	Over 80	6	60-70												
				7	Over 70												
99	Others																

SITC Code 74421 - Pulley tackle and hoists (other than skip hoists); winches and capstans

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic - 1		Manufacturing characteristic - 2		Manufacturing characteristic - 3		Origin	
Code	Name	Code	Lifting cap. (tons)	Code	Lifting height meters(m)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Winches**	1	Upto 1	1	Upto 1			1	Manual	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Windlasses	2	1-5	2	1-3			2	Electrical	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Capstans	3	5-10	3	3-5			3	Pneumatic	3	10-25	3	Alloy iron casting	3	2-5		
03	Single drum winches	4	10-25	4	5-10			4	Hydraulic	4	25-50	4	Malleable iron casting	4	5-10		
04	Multi drum winches	5	25-50	5	10-20			5	Gasoline/diesel	5	50-100	5	Spheroidal iron casting	5	10-15		
		6	50-100	6	20-30					6	100-200	6	Carbon steel casting	6	15-25		
10	**Hoists**	7	100-200	7	30-50					7	200-300	7	Alloy steel casting	7	25-50		
11	Cylinder hoists	8	200-300	8	Over 50					8	300-500	8	Non-ferrous casting	8	50-100		
12	Chain hoists	9	Over 300					9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
13	Cable hoists																
14	Rope hoists																
99	Others																

SITC Code 74422 - Ships derricks; cranes (other than cable cranes); mobile lifting frames

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		**Major Specification (Capacity)**		**Major Spec.-1** Optional		**Major Spec.-2** Optional		**Type**		**Manufacturing characteristic - 1**		**Manufacturing characteristic - 2**		**Manufacturing characteristic - 3**		**Origin**	
Code	**Name**	**Code**	**Lifting capacity (tons)**	**Code**	**Lifting height (m)**	**Code**		**Code**	**Description**	**Code**	**Weight(tons)**	**Code**	**Main body material**	**Code**	**Max. Component Weight(tons)**	**Code**	
00	Fixed cranes	1	Upto 5	1	Upto 5	1	Single hoist	1	Revolving	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Jib cranes	2	5-10	2	5-10	2	Double hoist	2	Travel trolley	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Boom cranes	3	10-25	3	10-20			3	Luffing	3	10-25	3	Alloy iron casting	3	2-5		
03	Derrick cranes	4	25-50	4	20-30			4	Revolving and luffing	4	25-50	4	Malleable iron casting	4	5-10		
04	Pillar cranes	5	50-100	5	30-50			5	Revolving and travel trolley	5	50-100	5	Spheroidal iron casting	5	10-15		
05	Tower cranes	6	100-200	6	Over 50			6	Reclaming	6	100-200	6	Carbon steel casting	6	15-25		
10	Traveling cranes (on rail runway)	7	200-300							7	200-300	7	Alloy steel casting	7	25-50		
11	Jib cranes	8	300-500					9	Others	8	300-500	8	Non-ferrous casting	8	50-100		
12	Portal jib cranes	9	Over 500							9	Over 500	9	Steel fabrication	9	Over 100		
13	Tower cranes																
14	Overhead bridge cranes																
15	Gantry cranes																
16	Portal gantry cranes																
17	Gantry bridges																
20	Mobile cranes																
21	Truck cranes																
22	Crawler cranes																
23	Railroad cranes																
99	Others																

SITC Code 744.23 - Elevators and conveyors, pneumatic.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification		Major Spec.-1		Major Spec.-2		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity (t/h)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body materials	Code	Plate thickness mm.	Code	
00	Pneumatic pipeline conveyors	1	Upto 10					1	Vacuum	1	Upto 5	1	Mild steel upto 0.20 carbon (untested quality)	1	Upto 20		1.Turkey
		2	10-25					2	Low pressure upto 0.1 KG/cm^2	2	5-10	2	Carbon steel above 0.20 carbon tested quality	2	20-40		2.Imported
10	Steam-pneumatic conveyors	3	25-50					3	Medium pressure 1-2 KG/cm^2	3	10-25	3	Boiler steel	3	40-50		
20	Air-activated gravity conveyors	4	50-100					4	High pressure 2-8 KG/cm^2	4	25-50	4	Alloy steel	4	Over 50		
		5	100-200							5	50-100	5	High alloy steel				
		6	200-300							6	100-200	6	Stainless steel				
		7	300-500							7	200-300	7	Non-ferrous materials				
		8	500-1000							8	300-500						
99	Others	9	Over 1000					9	Others	9	Over 500	9	Others				

SITC Code 744.24 - LIFTS AND SKIP HOISTS

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic - 1		Manufacturing characteristic - 2		Manufacturing characteristic - 3		Origin	
Code	Name	Code	Lifting capacity (tons)	Code	Lifting height (m)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	LIFTS	1	Upto 0.5	1	Upto 10			1	Drum	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Passenger lifts	2	0.5-1	2	10-20			2	Traction	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Freight lifts	3	1-5	3	20-30					3	10-25	3	Alloy iron casting	3	2-5		
03	Construction lifts	4	5-10	4	30-50					4	25-50	4	Malleable iron casting	4	5-10		
		5	10-20	5	50-100					5	50-100	5	Spheroidal iron casting	5	10-15		
10	Skip hoists	6	20-30	6	100-250					6	100-200	6	Carbon steel casting	6	15-25		
11	Mine skip hoists	7	30-40	7	250-500					7	200-300	7	Alloy steel casting	7	25-50		
12	Industrial skip hoists	8	40-50	8	500-1000					8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 50	9	Over 1000					9	Over 500	9	Steel fabrication	9	Over 100		
99	Others							9	Others								

SITC Code 744.26 - CONVEYORS, Mechanical

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic - 1		Manufacturing characteristic - 2		Manufacturing characteristic - 3		Origin	
Code	Name	Code	Capacity (t/h)	Code	Conveyor with (mm)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Belt conveyors	1	Upto 50	1	Upto 500			1	Bulk materials	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Flat belt conveyors	2	50-100	2	500-1000			2	Packaged or diverse parts	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Troughed belt conveyors	3	100-200	3	1000-1500					3	10-25	3	Alloy iron casting	3	2-5		
		4	200-300	4	1500-2000					4	25-50	4	Malleable iron casting	4	5-10		
10	Chain conveyors	5	300-400	5	Over 2000					5	50-100	5	Spheroidal iron casting	5	10-15		
11	Apron and pan conveyors	6	400-500							6	100-200	6	Carbon steel casting	6	15-25		
12	Slat and platform conveyors	7	500-750							7	200-300	7	Alloy steel casting	7	25-50		
13	Crossbar conveyors	8	750-1000							8	300-500	8	Non-ferrous casting	8	50-100		
14	Car type and pallet conveyors	9	Over 1000							9	Over 500	9	Steel fabrication	9	Over 100		
15	Trolley conveyors																
20	Haulage conveyors																
21	Scraper conveyors																
22	Drag conveyors																
23	Push-bar conveyors																
24	Push-plate conveyors																
25	Botton-rope conveyors																
30	Roller conveyors																
31	Straight roller conveyors																
32	Skewed roller conveyors																
33	Wheel conveyors																

SITC Code 744.26 - CONVEYORS, Mechanical

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origion	
Code	Name	Code	Capacity (t/h)	Code	Conveyor width (mm)	Code		Code	Description	Code	Weight (tons)	Code	Main Body Material	Code	Max Component Weight (tons)	Code	
40	**Screw conveyors**	1	Upto 50	1	Upto 500			1	Bulk materials	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
41	Screw paddle conveyors	2	50-100	2	500-1000			2	Packed or diverse parts	2	5-10	2	Grey iron casting	2	1-2	2	Imported
42	Screw ribbon conveyors	3	100-200	3	1000-1500			9	Others	3	10-25	3	Alloy iron casting	3	2-5		
43	Screw tube conveyors	4	200-300	4	1500-2000					4	25-50	4	Malleable iron casting	4	5-10		
50	**Elevating conveyors**	5	300-400	5	Over 2000					5	50-100	5	Spheroidal iron casting	5	10-15		
51	Bucket elevators	6	400-500							6	100-200	6	Carbon steel casting	6	15-25		
52	Bucket elevating conveyors	7	500-750							7	200-300	7	Alloy steel casting	7	25-50		
60	**Cable conveyors**	8	750-1000							8	300-500	8	Non-ferrous casting	8	50-100		
61	Aerial tramway	9	Over 1000							9	Over 500	9	Steel fabrication	9	Over 100		
62	Funicular railway																
70	**Feeders**																
71	Chute to/from conveyors																
72	Belt feeders																
73	Screw feeders																
74	Apron feeders																
75	Vibratory feeders																
76	Rotary disk feeders																

SITC Code 744.26 - CONVEYORS, Mechanical

Machines

PAGE: 3

6-7	8	9	10	11	12	13	14	15
Basic Machine Nomenclature	Major Specification (Capacity)	Major Spec.-1 Optional	Major Spec.-2 Optional	Type	Manufacturing characteristic -1	Manufacturing characteristic -2	Manufacturing characteristic -3	Origin
Name	Capacity (t/h)	Conveyor Width (mm)		Description	Weight (tons)	Main body material	Max Component Weight (tons)	
77. Bucket wheel feeders 78. Tubular wheel feeders 79. Chain wheel 80. Roller wheel feeders 81 Weight feeders 82. Travelling Tripper 99. Others	1. Upto 50 2. 50-100 3. 100-200 4. 200-300 5. 300-400 6. 400-500 7. 500-750 8. 750-1000 9. Over 1000	1. Upto 500 2. 500-1000 3. 1000-1500 4. 1500-2000 5. Over 2000		1. Bulk materials 2. Packed or diverse parts 9. Others	1. Upto 5 2. 5-10 3. 10-25 4. 25-50 5. 50-100 6. 100-200 7. 200-300 8. 300-500 9. Over 500	1. Chilled iron casting 2. Grey iron casting 3. Alloy iron casting 4. Malleable iron casting 5. Spheroidal iron casting 6. Carbon steel casting 7. Alloy steel casting 8. Non-ferrous casting 9. Steel fabrication	1. Upto 1 2. 1-2 3. 2-5 4. 5-10 5. 10-15 6. 15-25 7. 25-50 8. 50-100 9. Over 100	1. Turkey 2. Imported

SITC Code 744.28 - Other lifting, handling, loading and unloading machinery - STACKERS, DUMPERS.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Capacity (t/h)	Code		Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	**Stackers**	1	Upto 10					1	Stationary	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	High storage pallet stackers	2	10-25					2	Traveling	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	25-50							3	10-25	3	Alloy iron casting	3	2-5		
		4	50-100							4	25-50	4	Malleable iron casting	4	5-10		
		5	100-200							5	50-100	5	Spharoidal iron casting	5	10-15		
02	Rotating stackers	6	200-300							6	100-200	6	Carbon steel casting	6	15-25		
03	Stacking-reclaiming machine with bucket wheel	7	300-500							7	200-300	7	Alloy steel casting	7	25-50		
04	Stacking-reclaiming machine with scraper	8	500-1000							8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 1000					9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
10	**Dumpers**		Capacity of car loaded (t)														
11	Revolving open-car side dumpers	1.	10-20					1.	One car								
12.	Rolling open-car	2.	20-25					2.	Two cars								
		3.	25-30					9	Others								

SITC Code 744.28 - Other lifting, handling, loading and unloasing machinery

- STACKERS, DUMPERS.

6-7	8	9	10	11	12	13	14	15
Basic Machine Nomenclature	Major Specification (Capacity,	Major Spec.-1 Optional	Major Spec.-2 Optional	Type	Manufacturing characteristic -1	Manufacturing characteristic -2	Manufacturing characterisc -3	Origin
Name	Capacity (t/h)			Description	Weight (Tons)	Main body material	Max Component Weight(tons)	
side dumpers	5. 35-40			1. One car	1. Upto 5	1. Chilled iron casting	1. Upto 1	1. Turkey
13. High-lift open car-side dumpers	6. 40-45			2. Two cars	2. 5-10	2. Grey iron casting	2. 1-2	2. Imported
	7. 45-55				3. 10-25	3. Alloy iron casting	3. 2-5	
14. Turnover open-car side	8. 55-120				4. 25-50	4. Malleable iron casting	4. 5-10	
15. End-tilt open-car dumpers	9. Over 120			9. Others	5. 50-100	5. Spheroidal iron casting	5. 10-25	
16. Tilting and revolving box car dumpers					6. 100-200	6. Carbon steel casting	6. 15-25	
					7. 200-300	7. Alloy steel casting	7. 20-50	
					8. 300-500	8. Non-ferrous casting	8. 50-100	
					9. Over 500	9. Steel fabrication	9. Over 100	

SITC Code 74525 - Weighing machinery, including weight-operated counting and checking machines.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification		Major Spec.-1 (Optional)		Major Spec.-2 (Optional)		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Weighing Capacity (Tons)	Code	Platform size m2	Code		Code	Description	Code	Weight (tons)	Code	Main body material	Code	Max. Component Weight (tons)	Code	
01	Table/yard scales	1	Upto 0.5	1	Upto 1	1	Mechanical	1	Fixed	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Floor platform vehicle scales	2	0.5-1	2	1-3	2	Electrical	2	Mobile	2	5-10	2	Grey iron casting	2	1-2	2	Imported
03	Floor platform wagon scales	3	1-5	3	3-7					3	10-25	3	Alloy iron casting	3	2-5		
04	Weigh-hopper scales	4	5-10	4	7-10					4	25-50	4	Malleable iron casting	4	5-10		
05	Bags handling and weighing scales	5	10-25	5	10-20					5	50-100	5	Spheroidal iron casting	5	10-15		
06	Conveyor scales	6	25-50	6	20-50					6	100-200	6	Carbon steel casting	6	15-25		
07	Crane scales	7	50-100	7	50-100					7	200-300	7	Alloy steel casting	7	25-50		
		8	100-200	8	Over 100					8	300-500	8	Non-ferrous casting	8	50-100		
		9	200-500							9	Over 500	9	Steel fabrication	9	Over 100		
		10	Over 500														
99	Others					9	Others	9	Others								

SITC Code: 74931 - Transmission shafts, cranks, bearing housing, plain shaft bearings, gears and gearing (including friction gears and gear boxes and other variable speed gears, flywheels, pulleys and pulley blocks, clutches and shaft comnlings.

6 - 7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Spec. (Capacity)		Major Spec.1 (Optional)		Major Spec.2 (Optional)		Type		Manufacturing Characteristic 1		Manufacturing Characteristic 2		Manufacturing Characteristic 3		Origin	
Code	Name	Code	Output range (KW)	Code	Reduction ratio	Code	Drive direction	Code	Desc.	Code	Weight (Tons)	Code	Main body material	Code	Max. component weight (Tons)	Code	
00	Reduction drives	1	Upto 100	1	1-5	1	Parallel axis	1	Single stage	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Speer gears reduction drives.	2	100-200	2	1-10	2	Angle axis	2	Double stage	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Single helical gear reduction drives.	3	200-400	3	1-20	3	Other	3	Multiple stage	3	10-25	3	Alloy iron casting	3	2-5		
03	Double helical gear reduction drives.	4	400-800	4	1-50					4	25-50	4	Malleable iron casting	4	5-10		
04	Bevel gearing reduction drives.	5	800-1600	5	1-100					5	50-100	5	Spheroidal iron casting	5	10-15		
05	Worm and worm-wheel reduction drives.	6	1600-2000	6	1-Over 100					6	100-200	6	Carbon steel casting	6	15-25		
		7	2000-2400							7	200-300	7	Alloy steel casting	7	25-50		
		8	2400-2800							8	300-500	8	Non-ferrous casting	8	50-100		
		9	Above 2800							9	Over 500	9	Steel fabrication	9	Over 100		
99	Others					9	Others	9	Others								

SITC Code 771.11 - Liquid Dielectric Transformers -

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Output (MVA)	Code	H.V. winding voltage (KV)	Code	No. of phase	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Power plant step-up transformers	1.	Upto 1	1.	3	1.	Single phase	1.	Oil	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
		2.	1-5	2.	6	2.	Three phase			2.	5-10	2.	Grey iron casting	2.	1-2	2.	Import
10	Transmission-distribution step-down transformers	3.	5-16	3.	10					3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	16-25	4.	15					4.	25-50	4.	Malleable iron casting	4.	5-10		
		5.	25-50	5.	25					5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	50-100	6.	30					6.	100-200	6.	Carbon steel casting	6.	15-25		
		7.	100-150	7.	60					7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	150-200	8.	150					8.	300-500	8.	Non-ferrous casting	8.	50-100		
		9.	Over 200	9.	380					9.	Over 500	9.	Steel fabrication	9.	Over 100		
99	Others					9	Others	9	Others								

SITC Code 771.12 - Transformers, electrical - CURRENT TRANSFORMERS

6-7		8		9		10		11		12		13		14		15	
Basic Machine nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origi	
Code	Name	Code	Rated output (VA)	Code	Rated primary voltage (KV)	Code	Class	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Indoor current transformers	1.	Upto 2.5	1.	Upto 3	1.	0.1	1.	Single-core	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
		2.	2.5-10	2.	6	2.	0.2	2.	Multi-core	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Import
10	Outdoor current transformers	3.	10-15	3.	10	3.	0.5			3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	15-30	4.	15	4.	1.0			4.	25-50	4.	Malleable iron casting	4.	5-10		
20	Bushing type current transformers	5.	30-60	5.	25	5.	3.0			5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	60-120	6.	30	6.	5.0			6.	100-200	6.	Carbon steel casting	6.	15-25		
		7.	120-200	7.	60					7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	200-500	8.	150					8.	300-500	8.	Non-ferrous casting	8.	50-100		
		9.	Over 500	9.	380			9.	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		
99	Others																

STTC Code 771.13 - Transformers, electrical - VOLTAGE TRANSFORMERS

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Rated output (VA)	Code	Rated primary voltage (KV)	Code	Class	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Indoor voltage transformers	1.	Upto 10	1.	Upto 3	1.	0.1	1.	Single-core	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
01	- Capacitive	2.	10-25	2.	6	2.	0.2	2.	Multi-core	2.	5-10			2.	1-2	2.	Imported
02	- Inductive	3.	25-100	3.	10	3.	0.5			3.	10-25	2.	Grey iron casting	3.	2-5		
		4.	100-200	4.	15	4.	1.0			4.	25-50			4.	5-10		
10	Outdoor voltage transformers	5.	200-500	5.	25	5.	3.0			5.	50-100	3.	Alloy iron casting	5.	10-15		
11	- Capacitive	6.	Over 500	6.	30	6.	5.0			6.	100-200			6.	15-25		
12	- Inductive			7.	60					7.	200-300	4.	Malleable iron casting	7.	25-50		
				8.	150					8.	300-500			8.	50-100		
				9.	380			9.	Others	9.	Over 500	5.	Spheroidal iron casting	9.	Over 100		
												6.	Carbon steel casting				
												7.	Alloy steel casting				
												8.	Non-ferrous casting				
99	Others											9.	Steel fabrication				

SITC Code 771.18 - Other Electrical Transformers

6-7		8		9		10		11		12		13		14		15
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin
Code	Name	Code	Output (MVA)	Code	H.V. winding voltage (KV)	Code	No. of phase	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Rural electrification transformers	1.	Upto 1	1.	3	1.	Single phase	1.	Askarel	1.	Upto 5	1.	Chilled iron casting	1.	Upto 1	1.	Turkey
		2.	1-5	2.	6	2.	Three phase	2.	Solid insulation	2.	5-10	2.	Grey iron casting	2.	1-2	2.	Importe
10	Auxiliary power transformers	3.	5-16	3.	10			3.	Air	3.	10-25	3.	Alloy iron casting	3.	2-5		
		4.	16-23	4.	15			4.	Gas	4.	25-50	4.	Malleable iron casting	4.	5-10		
20	Auto-tansformers	5.	25-50	5.	25					5.	50-100	5.	Spheroidal iron casting	5.	10-15		
		6.	50-100	6.	30					6.	100-200	6.	Carbon steel casting	6.	15-25		
30	Special transformers	7.	100-150	7.	60					7.	200-300	7.	Alloy steel casting	7.	25-50		
		8.	150-200	8.	150					8.	300-500	8.	Non-ferrous casting	8.	50-100		
		9.	Over 200	9.	380			9.	Others	9.	Over 500	9.	Steel fabrication	9.	Over 100		
99	Others																

SITC Code 771.22 - Inductors - POWER REACTORS.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
	Name	Code	Capacity (MVAR)	Code	Rated voltage (KV)	Code	Insulation medium	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
0	Series reactors	1	Upto 10	1	Upto 3	1	Dry	1	With magnetic core and electromagnetic shield	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
3	Shunt reactors	2	10-30	2	6	2	Oil immersed	2	Without magnetic core and electromagnetic shield	2	5-10	2	Grey iron casting	2	1-2	2	Imported
0	Single phase neutral grounding reactors	3	30-60	3	10			3	With magnetic core and without magnetic shield	3	10-25	3	Alloy iron casting	3	2-5		
0	Arc suppression coils	4	60-80	4	15			4	Without magnetic core and with magnetic shield	4	25-50	4	Malleable iron casting	4	5-10		
0	Three-phase neutral electromagnetic couplers	5	80-100	5	25					5	50-100	5	Spheroidal iron casting	5	10-15		
		6	100-120	6	30					6	100-200	6	Carbon steel casting	6	15-25		
		7	120-150	7	60					7	200-300	7	Alloy steel casting	7	25-50		
		8	150-200	8	150					8	300-500	8	Non-ferrous casting	8	50-100		
		9	Over 200	9	300					9	Over 500	9	Steel fabrication	9	Over 100		
99	Others					9	Others	9	Others								

SITC Code 772.11 - Electrical apparatus for making and breaking, for protecting and for making connections to or in electrical circuits.
- CIRCUIT BREAKERS

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Rated voltage (KV)	Code	Rated current (A)	Code	Rated symetrical short circuit current (KA)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Circuit breakers Single phase	1	Upto 3	1	400-800	1	6.3-8	1	Oil	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
		2	6	2	1250	2	10	2	Low-oil	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	10	3	1600	3	12.5	3	Air blast	3	10-25	3	Alloy iron casting	3	2-5		
10	Circuit breakers Three phase	4	15	4	2000	4	16	4	SF_6	4	25-50	4	Malleable iron casting	4	5-10		
		5	25	5	2500	5	20-25			5	50-100	5	Spheroidal iron casting	5	10-15		
		6	30	6	3150	6	31.5			6	100-200	6	Carbon steel casting	6	15-25		
99	Others	7	60	7	4000	7	40			7	200-300	7	Alloy steel casting	7	25-50		
		8	150	8	5000	8	50			8	300-500	8	Non-ferrous casting	8	50-100		
		9	380	9	6300	9	63 and above	9	Others	9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 772.12 - Electrical apparatus for making and breaking, for protecting and for making connections to or in electrical circuits - Switches.

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Rated voltage (KV)	Code	Rated current (A)	Code	Rated breaking current (A)	Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Single phase switches	1	3	1	630-400	1	0	1	Pantograph	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
01	Disconnecting switches	2	6	2	800	2	1-200	2	Semi-pantograph	2	5-10	2	Grey iron casting	2	1-2	2	Imported
02	Grounding switches	3	10	3	1250	3	200-400	3	Rotating-center post	3	10-25	3	Alloy iron casting	3	2-5		
03	Load-break switches	4	15	4	1600	4	400-630	4	Two-post on one phase	4	25-50	4	Malleable iron casting	4	5-10		
		5	25	5	2000	5	Over 630	5	Knife	5	50-100	5	Spheroidal iron casting	5	10-15		
10	Three phase switches	6	30	6	2500					6	100-200	6	Carbon steel casting	6	15-25		
11	Disconnecting switches	7	60	7	3150					7	200-300	7	Alloy steel casting	7	25-50		
12	Grounding switches	8	150	8	4000					8	300-500	8	Non-ferrous casting	8	50-100		
13	Load-break switches	9	380	9	5000 and above			9	Others	9	Over 500	9	Steel fabrication	9	Over 100		
99	Others																

SITC Code 772.13 - Electrical apparatus for making and breaking, for protecting and for making connections to or in electrical circuits - LIGHTNING ARRESTERS.

6-7		8	9	10	11	12	13	14	15
Basic Machine Nomenclature		Major Specification (Capacity)	Major Spec.-1 Optional	Major Spec.-2 Optional	Type	Manufacturing characteristic -1	Manufacturing characteristic -2	Manufacturing characteristic -3	Origin
	Name	Rated voltage (KV)	Discharge current (KA)		Description	Weight(tons)	Main body materials	Max. Component Weight(tons)	
00	Non-linear resistor type	1. Upto 6	1. 1500		1. Light duty	1. Upto 5	1. Chilled iron casting	1. Upto 1	1. Turkey
		2. 6-21	2. 2500		2. Heavy duty	2. 5-10	2. Grey iron casting	2. 1-2	2. Imported
		3. 21-42	3. 5000		3. Series A	3. 10-25	3. Alloy iron casting	3. 2-5	
		4. 42-108	4. 10000		4. Series B	4. 25-50	4. Malleable iron casting	4. 5-10	
		5. 108-198	5. 30000		9. Others	5. 50-100	5. Spheroidal iron casting	5. 10-15	
10	Expulsion type	6. 198-225	6. 65000		1. Distribution	6. 100-200	6. Carbon steel casting	6. 15-25	
		7. 225-396			2. Transmission	7. 200-300	7. Alloy steel casting	7. 25-50	
		8. Over 396				8. 300-500	8. Non-ferrous casting	8. 50-100	
						9. Over 500	9. Steel fabrication	9. Over 100	
99	Others				9 Others				

SITC Code 778.12 - Electric accumulators (storage batteries)

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Standard battery voltage(V)	Code	Capacity (Ah)	Code		Code	Description	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
00	Lead-acid batteries	1	12	1	Upto 60					1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
10	Alkaline (nickel-cadmium) batteries	2	24	2	60-120					2	5-10	2	Grey iron casting	2	1-2	2	Imported
20	Car batteries	3	48	3	120-240					3	10-25	3	Alloy iron casting	3	2-5		
99	Others	4	60	4	Above 240					4	25-50	4	Malleable iron casting	4	5-10		
		5	110							5	50-100	5	Spheroidal iron casting	5	10-15		
		6	220							6	100-200	6	Carbon steel casting	6	15-25		
										7	200-300	7	Alloy steel casting	7	25-50		
										8	300-500	8	Non-ferrous casting	8	50-100		
		9	Others							9	Over 500	9	Steel fabrication	9	Over 100		

SITC Code 778.84 - Electrical capacitors (condensers) fixed or variable

6-7		8		9		10		11		12		13		14		15	
Basic Machine Nomenclature		Major Specification (Capacity)		Major Spec.-1 Optional		Major Spec.-2 Optional		Type		Manufacturing characteristic -1		Manufacturing characteristic -2		Manufacturing characteristic -3		Origin	
Code	Name	Code	Rated voltage of the system (KV)	Code	Rated output of the bank (MVAR)	Code	Rated output of the unit (KVAR)	Code	Description (insulation)	Code	Weight(tons)	Code	Main body material	Code	Max. Component Weight(tons)	Code	
01	Power Capacitors Shunt capacitors	1	Upto 3	1	Upto 10	1	Upto 20	1	Solid	1	Upto 5	1	Chilled iron casting	1	Upto 1	1	Turkey
02	Series capacitors	2	6	2	10-25	2	20-50	2	Liquid	2	5-10	2	Grey iron casting	2	1-2	2	Imported
		3	10	3	25-50	3	50-100	3	Gas	3	10-25	3	Alloy iron casting	3	2-5		
		4	15	4	50-75	4	100-150			4	25-50	4	Malleable iron casting	4	5-10		
		5	25	5	75-100	5	150-200			5	50-100	5	Spheroidal iron casting	5	10-15		
		6	30	6	100-150	6	200-250			6	100-200	6	Carbon steel casting	6	15-25		
		7	60	7	150-200	7	250-300			7	200-300	7	Alloy steel casting	7	25-50		
		8	150	8	200-300	8	300-400			8	300-500	8	Non-ferrous casting	8	50-100		
		9	300	9	Over 300	9	Over 400			9	Over 500	9	Steel fabrication	9	Over 100		
99	Others							9	Others								